STOPPING WATER POLLUTION AT ITS SOURCE

MISA

Municipal Industrial Strategy for Abatement

ACUTE LETHALITY DATA FOR ONTARIO'S PULP AND PAPER SECTOR EFFLUENTS COVERING THE PERIOD FROM JANUARY 1990 TO JUNE 1990

Ontario

Environment
Environnement

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Report Prepared By:

Aquatic Toxicity Unit
Water Resources Branch
Ontario Ministry of the Environment

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Report Prepared By:

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Aquatic Toxicity Unit
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SUMMARY

Under the MISA program, the Pulp and Paper Sector was required to conduct laboratory toxicity tests to monitor its wastewater discharges for acute lethality to rainbow trout and to *Daphnia magna*. This requirement was based on the Ontario Environmental Protection Act, which allows the Ministry to write regulations requesting persons responsible for sources of contaminants to monitor, record and report to the Ministry. The requirements for toxicity testing are identified in the General Effluent Monitoring Regulation (Ontario Regulation 695/88) and in the Effluent Monitoring Regulation For The Pulp And Paper Sector (Ontario Regulation 435/89). Some additional information is identified in, "The Development Document For The Effluent Monitoring Regulation For The Pulp And Paper Sector" (Env. Ont. 1989). The monitoring data will be used, in part, to develop effluent limits for acute toxicity. This report is a compilation of the toxicity data for samples collected in the first six months of the program and for audit samples tested at the Ministry's laboratory in Rexdale.

The regulatory toxicity tests were conducted following standard procedures (Protocol To Determine The Acute Lethality Of Liquid Effluents To Fish, Env. Ont. July 1983 and *Daphnia magna* Acute Lethality Toxicity Test Protocol, Env. Ont. April 1988). In these tests, the organisms are exposed to undiluted effluent and several effluent dilutions for a fixed period. A trout test is a 96 hour exposure, and a *Daphnia* test is a 48 hour exposure. The number of organisms that die is the toxic effect that is recorded. The quantitative measure of toxicity is the median lethal concentration (LC50). It is the concentration of effluent estimated to cause mortality to 50% of the test organisms.

The collection of samples for toxicity testing coincided with the collection of samples for chemical characterization, also required under this regulation. The frequency of sampling for toxicity testing was monthly, except if three consecutive trout tests had no more than 50% mortality at any concentration, then a sampling frequency of once every three months (quarterly) was permitted for further trout tests. For cooling waters, single concentration tests of undiluted effluent were permitted for quarterly samples only.

The monitoring occurred at 40 sampling locations at 27 mills. For the period of January to June 1990, the Ministry received the results of 188 trout and 217 *Daphnia* tests. For trout: 70 samples were nonlethal, 23 samples were LC50 > 100% effluent and 95 samples were lethal (LC50 < 100% effluent). For *Daphnia*: 77 samples were nonlethal, 36 samples were LC50 > 100% effluent and 104 samples were lethal. Figures 1 to 16, following the Summary, are graphs of the data (LC50s and 95% confidence limits) for selected discharge points.

The Aquatic Toxicity Unit of Environment Ontario tested 41 "audit" samples over the monitoring period, and found that the results of audits were generally consistent with

the results submitted by industry. The differences that were observed between the results can be explained primarily by temporal variation in effluent quality; the audits were not tests of split samples, and different samples had different chemical compositions.

A preliminary interpretation of the toxicity results is given below, concerning the possible causes of acute lethality. The Toxicity Test Reports for the samples and a report that summarizes the analytical chemistry data for each process effluent (Preliminary Report on the First Six Months of Process Effluent Monitoring in the MISA Pulp and Paper Sector, Env. Ont. Feb. 1991) were used for this purpose.

COOLING WATER. Most samples of cooling water (33 of 37) were nonlethal to trout, 3 samples were LC50 > 100% effluent and 1 sample was lethal. 42 samples were tested for *Daphnia* toxicity: 24 were nonlethal, 12 were LC50 > 100% effluent and 6 were lethal. 5 of the 6 samples from Kimberly-Clark, Terrace Bay were toxic to *Daphnia*. Residual chlorine, from the municipal water supply to the mill, was the probable cause.

SULPHATE (KRAFT) MILLS. These samples were toxic and the trout test was generally more sensitive than the *Daphnia* test (except the samples from Malette, which were equally toxic to both animals). E.B. Eddy, Espanola and Kimberly-Clark, Terrace Bay have secondary treatment and their effluents were generally nonlethal. Boise Cascade, Fort Frances and Canadian Pacific, Dryden also have secondary treatment, but their samples still had some toxicity to trout. The most toxic effluent samples tended to be from the mills that do not have secondary treatment: Canadian Pacific, Thunder Bay (high resin acids and low dissolved oxygen (DO)), James River-Marathon (low pH) and Malette (low pH and high resin acids). The samples from Domtar (Cornwall and Red Rock) were often toxic, and resin acids were suspected.

SULPHITE-MECHANICAL MILLS. Most samples were toxic to both animals. In many of the *Daphnia* tests, low DO concentrations were measured and the samples usually had a high biological oxygen demand. High concentrations of total resin acids occurred frequently and could explain the usually greater sensitivity of trout compared to *Daphnia* (except St. Mary's samples, for which neither animal was consistently more sensitive). The biological uptake of resin acids is highest under acidic conditions and pH itself may be toxic when it is outside the range 5.5 to 9.5. The samples with low pH were from: Abitibi-Price Thunder Bay, Abitibi-Price Iroquois Falls and Boise Cascade, Kenora. The effluent samples of Abitibi-Price Provincial Papers and of Quebec and Ontario Paper were usually nonlethal. The latter mill has a secondary treatment system and a program for waste reuse and recycling.

CORRUGATING MILLS. The audit samples of the two effluents at MacMillan Bloedel, Sturgeon Falls were lethal to both test animals. Low pH, low DO and possibly resin acids were suspected causes. The samples of Domtar, Trenton were toxic to both

animals and resin acids and low DO were suspected causes.

DEINKING-BOARD-FINE PAPERS-TISSUE MILLS. The samples of these effluents were the least toxic to both animals. The best examples were the mills of Kimberly-Clark (St. Catharines and Huntsville). The latter mill has a small seasonal discharge due to its effective procedures for wastewater recycling and treatment. Strathcona Paper Company, Napanee has secondary treatment, but three samples were still toxic to trout and/or *Daphnia*. The samples from Noranda Forest, Thorold were toxic to both animals, probably due to residual chlorine. Noranda Forest has since installed a dechlorination system as a proactive abatement action. The samples from E.B. Eddy, Ottawa were more toxic to *Daphnia* than to trout. High levels of suspended solids (clay) may have been responsible.

Overall, the data suggest that resin acids, pH extremes and low DO were the primary causes of acute lethality in the samples of pulp and paper effluents. The impact of pH cannot be separated from that of the other toxicants because it can have a direct toxic action and a modifying effect on the physical, chemical and toxic properties of other effluent constituents. The interpretation of the toxicity data from the chemical characterizations was difficult because the samples contained many substances.

While *Daphnia* tended to be less sensitive than trout, there were many samples for which the reverse was true. For 111 samples, an LC50 was measured for at least one of the two species. Trout was more sensitive to 51 of these samples, *Daphnia* was more sensitive to 26 samples and there was no difference in species sensitivity to 34 samples. The samples from St. Mary's exemplify this variability in toxicity to the two species. Since *Daphnia* is a filter-feeder, it may respond additionally to the suspended solids in these effluents. There was some evidence that low DO levels (high BOD) were a toxic factor in *Daphnia* tests. The toxicity database for the pulp and paper sector shows that tests of both species are needed to better assess and control the potential impact of these complex and variable effluents on the aquatic environment.

The most toxic effluent samples were from the mills in the Sulphate (Kraft), Sulphite-Mechanical and Corrugating categories that did not have secondary treatment of all effluents. The least toxic and nonlethal samples were generally from the Deinking-Board-Fine Papers-Tissue mills and from the mills that have secondary treatment systems. There were exceptions, as noted above. Further generalizations relating mill processes and treatment technologies to the toxicity of process effluents are difficult because toxicity will be influenced by other factors such as chemical spills, overloading, differences in wood furnish and the daily operation and maintenance of "ex-plant" treatment systems. Also, some results may reflect seasonal differences or process changes over the six month period of sampling. A more detailed analysis of all the available data for the whole year of monitoring (toxicity, chemistry and facility operations) is necessary before the cause of toxicity can be confirmed with

any assurance for a specific effluent. This would require, in part, a review of the chemical characterization of each sample that coincided with a toxicity sample.

The toxicity tests will detect harmful concentrations and mixtures of most chemical constituents of effluents. But compliance with end-of-pipe limits for acute toxicity would not necessarily control the potential effects of environmental contamination that can be caused by the loading of bioaccumulative substances. These substances are generally nonpolar organic chemicals of high molecular weight and low water solubility. A chemical-specific assessment of this hazard is difficult because of the large number of organic substances in these effluents. Hydrophobic chemicals would be mostly sorbed to the suspended solids in the effluents, rather than in aqueous solution. The implication is that control of the suspended solids could, as a side benefit, also control the bioaccumulative substances.

The MISA toxicity database is generally complete, except for the trout data from the four Domtar mills for five of the six months which were not accepted because the tests were invalid due to a test temperature problem. The *Daphnia* test data were not accepted for nine samples from Boise Cascade, Fort Frances, one sample from Boise Cascade, Kenora and one sample from Canadian Pacific, Dryden because the tests were invalid due to excessive control mortality. An inspection was conducted on the testing laboratory for MacMillan Bloedel Inc., Sturgeon Falls. This inspection was conducted in response to several problems encountered with the toxicity data received by the Ministry on behalf of the company. The inspection revealed several problems at the testing laboratory, therefore, the data submitted for their client have been removed from the database. The Toxicity Test Reports for 12 samples (129000-01, -02, -03, -04, -05, -06, -07, -08, -18, -20, -21 and -65) from four mills have some technical reporting problems, but were included to facilitate a more complete review of available information.

The body of this report, following the figures, presents the summaries of the acute lethality data, grouped by company. These summary pages are part of the complete database, that includes the Toxicity Test Report submitted by industry for each test sample. The complete database is available from the Water Resources Branch, Toronto, upon request. The comment fields on individual Toxicity Test Reports were entered by the industry's laboratory performing the tests, and should not be expected to be consistent across samples and do not necessarily represent the views of the Ministry.

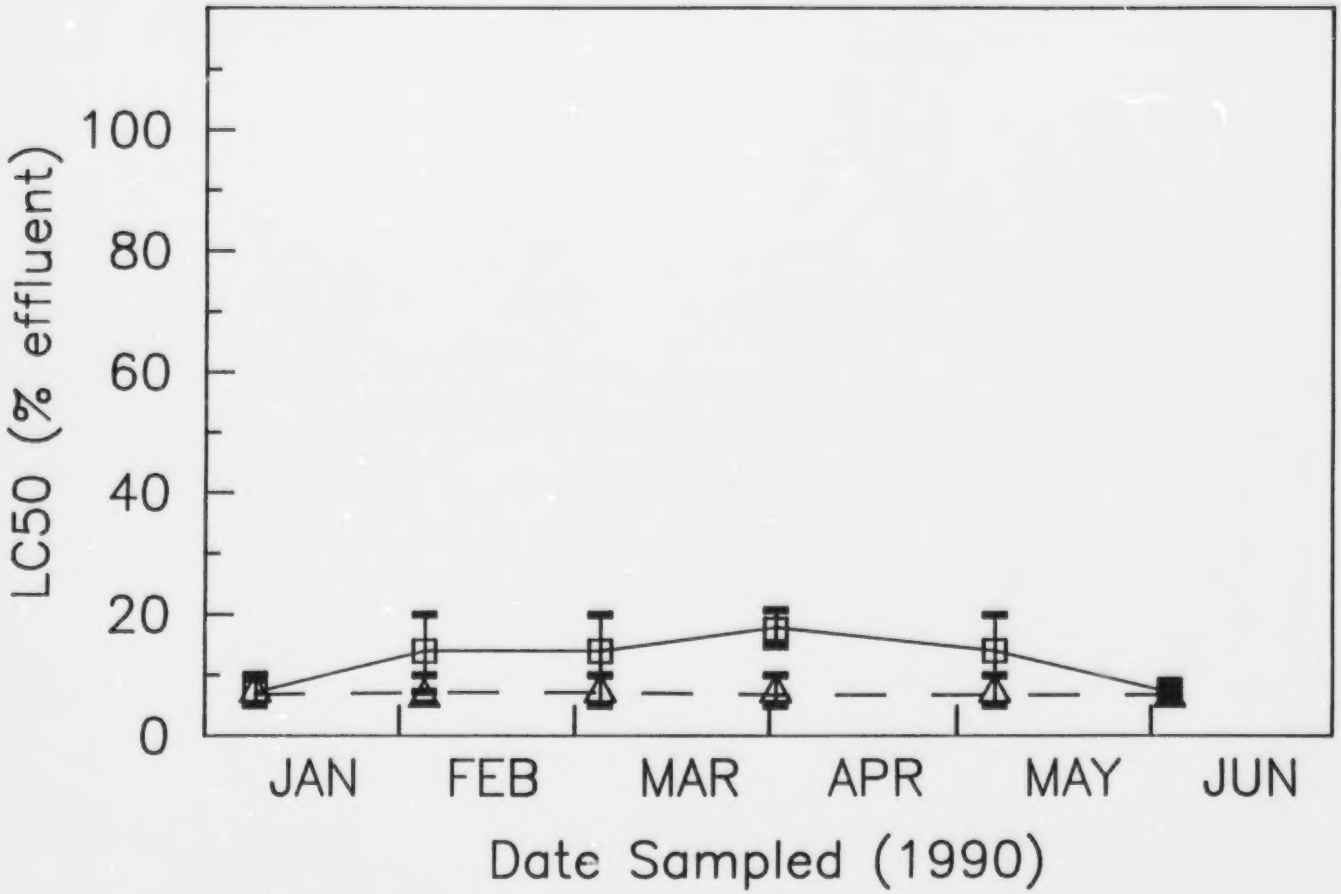

Figure 1. The toxicity of effluent samples from Abitibi-Price Inc., Iroquois Falls Division, Iroquois Falls, Total Outfall. (Δ Trout, □ *Daphnia magna*).

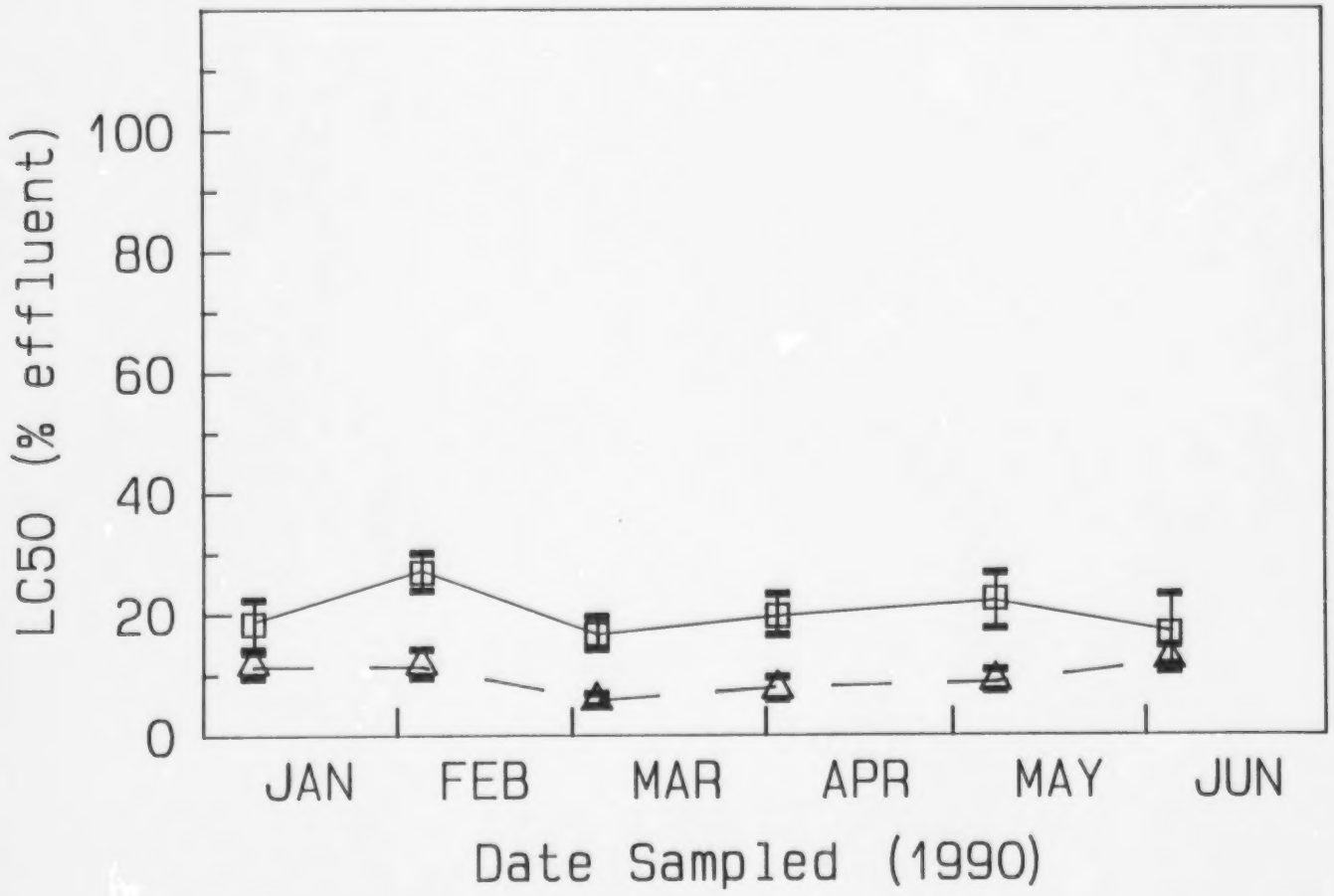

Figure 2. The toxicity of effluent samples from Abitibi-Price Inc., Fort William Division, Thunder Bay, Main Sewer Lagoon #1. (Δ Trout, □ *Daphnia magna*).

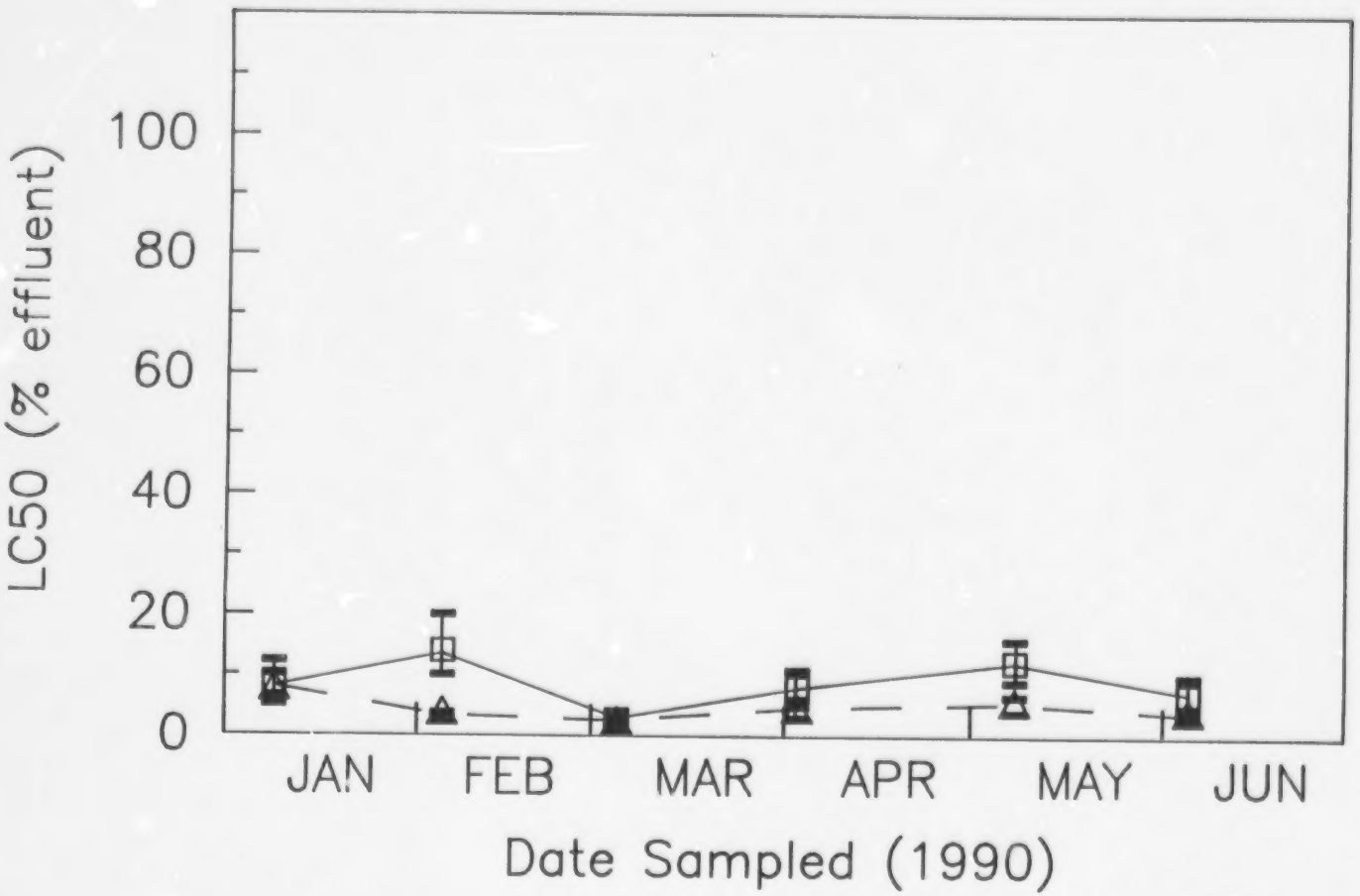

Figure 3. The toxicity of effluent samples from Abitibi-Price Inc., Fort William Division, Thunder Bay, Bark Lagoon #2. (Δ Trout, □ *Daphnia magna*).

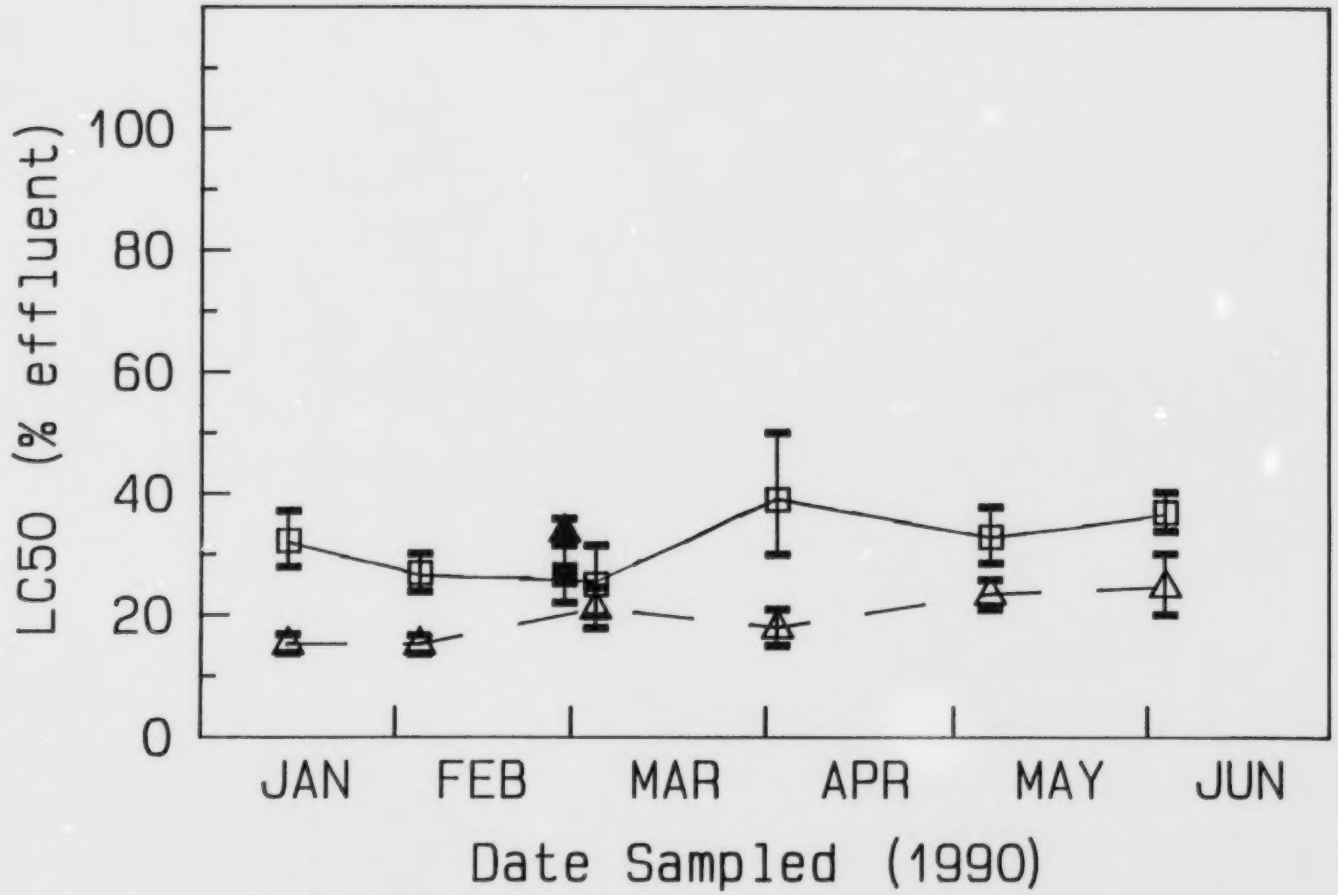

Figure 4. The toxicity of effluent samples from Abitibi-Price Inc., Thunder Bay Division, Thunder Bay, Primary Lagoon Outfall #2. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

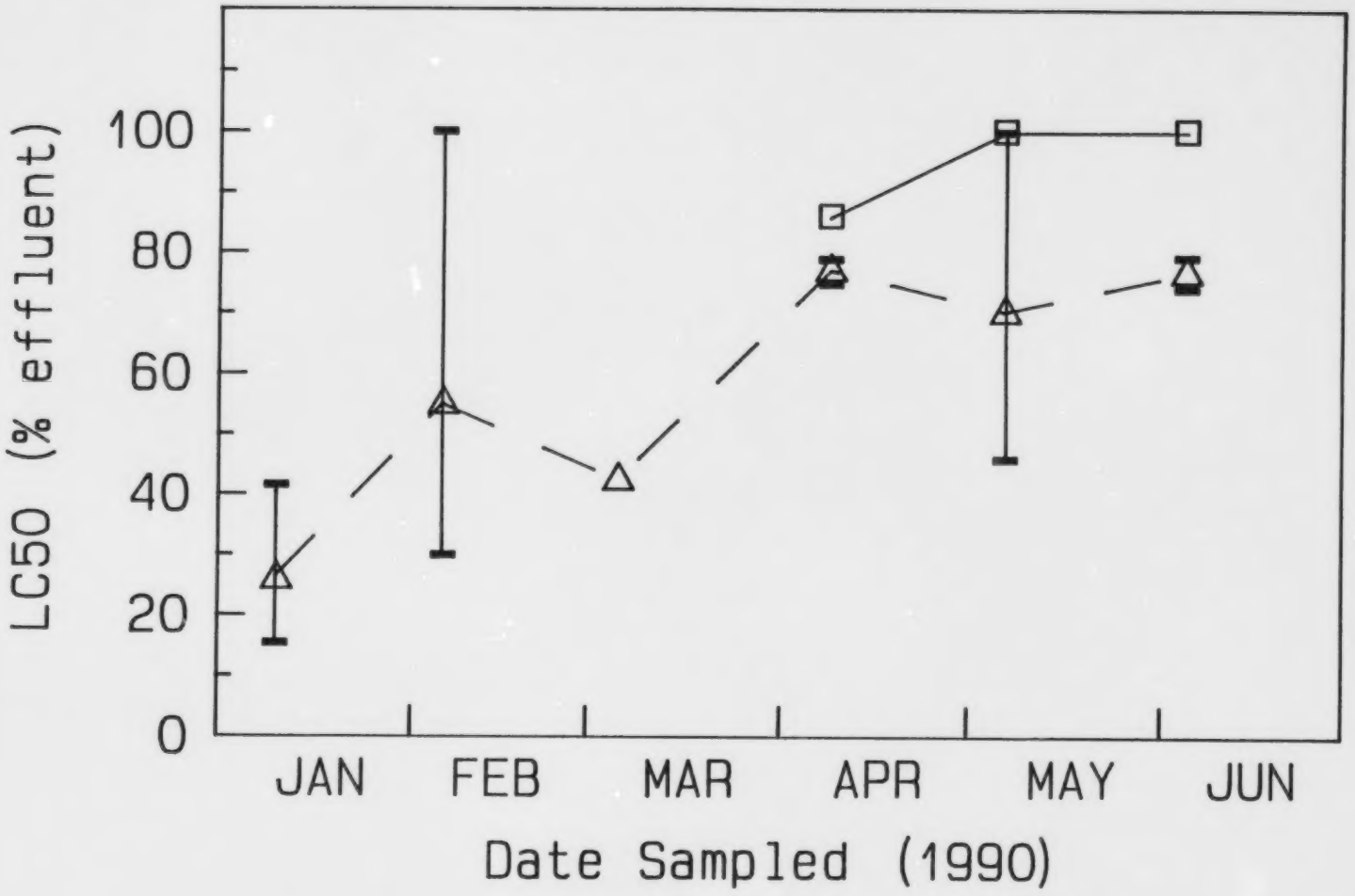

Figure 5. The toxicity of effluent samples from Boise Cascade Canada Ltd., Fort Frances, Total Mill Effluent. (Δ Trout, □ *Daphnia magna*).

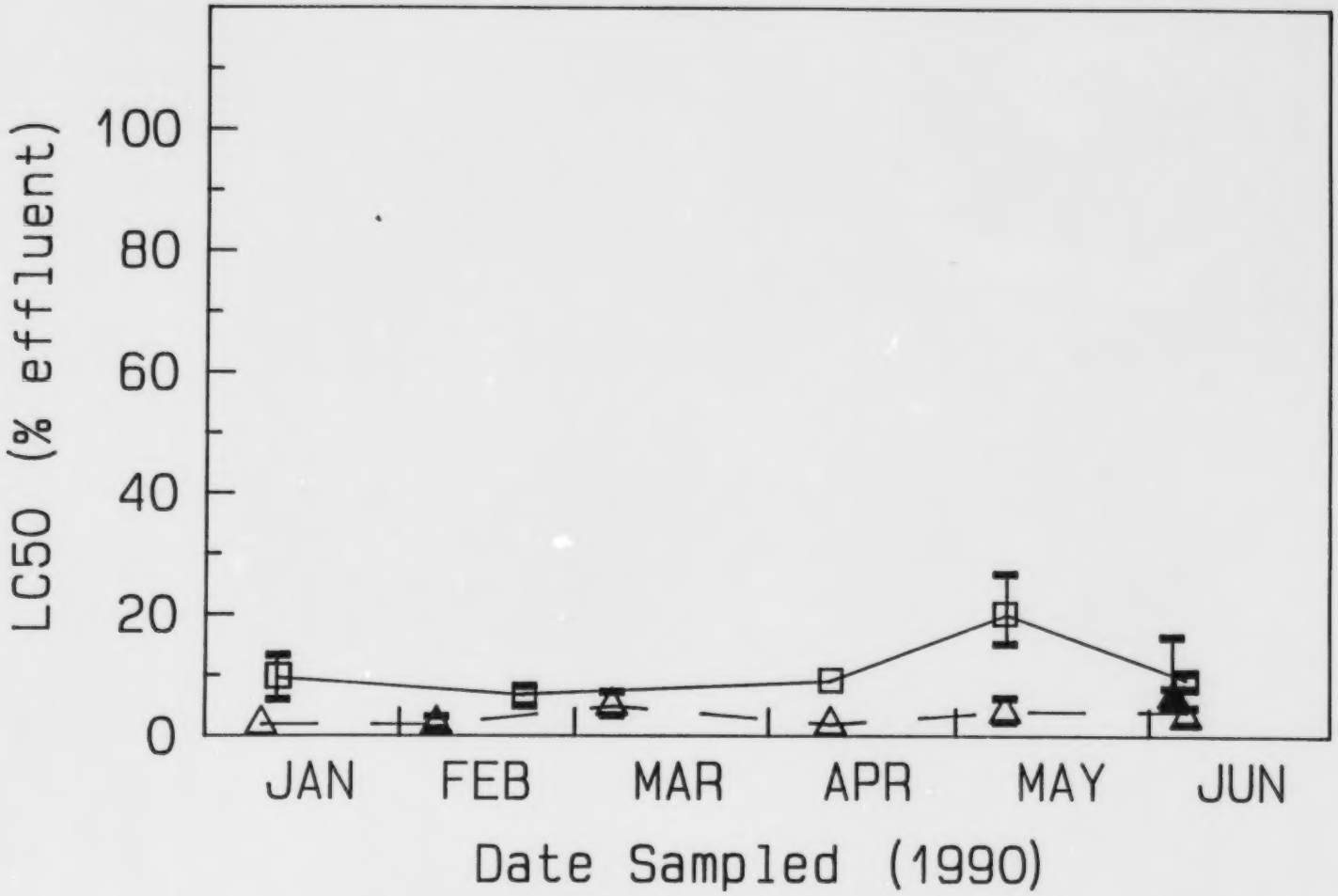

Figure 6. The toxicity of effluent samples from Boise Cascade Canada Ltd., Kenora, Final Effluent. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

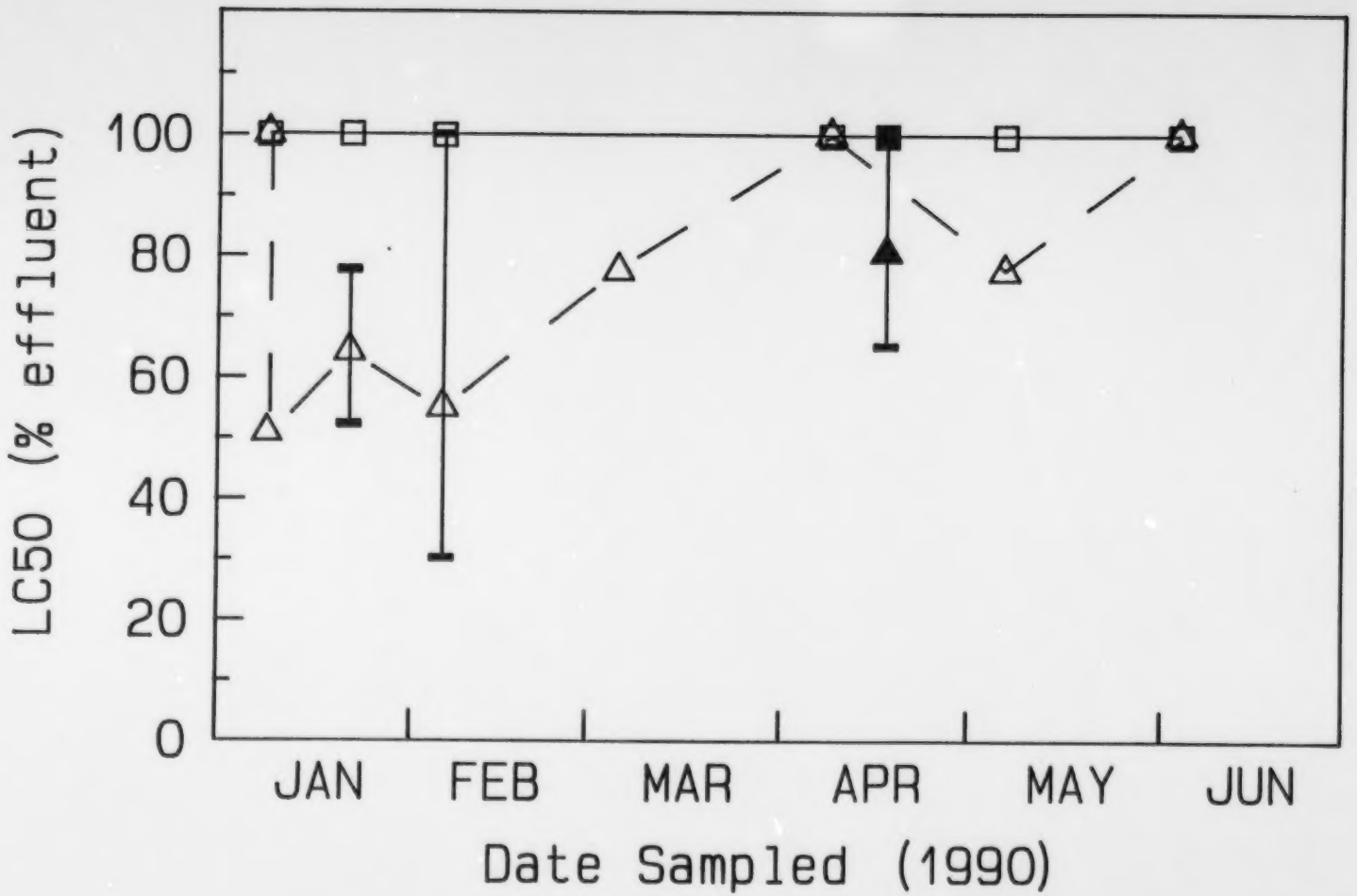

Figure 7. The toxicity of effluent samples from Canadian Pacific Forest Products Ltd., Dryden, Final Effluent. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

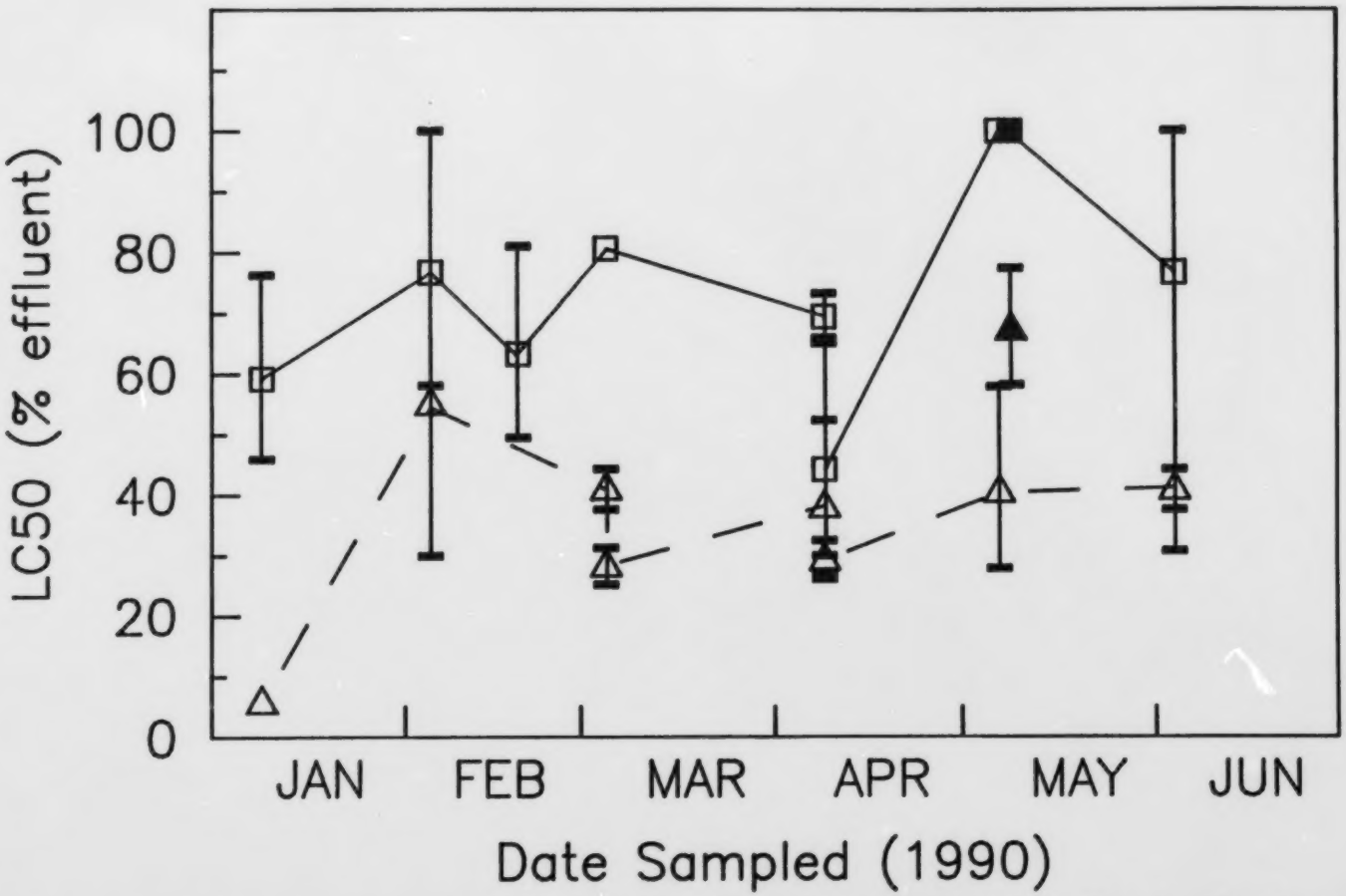

Figure 8. The toxicity of effluent samples from Canadian Pacific Forest Products Ltd., Thunder Bay, Combined Mill Outfall. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

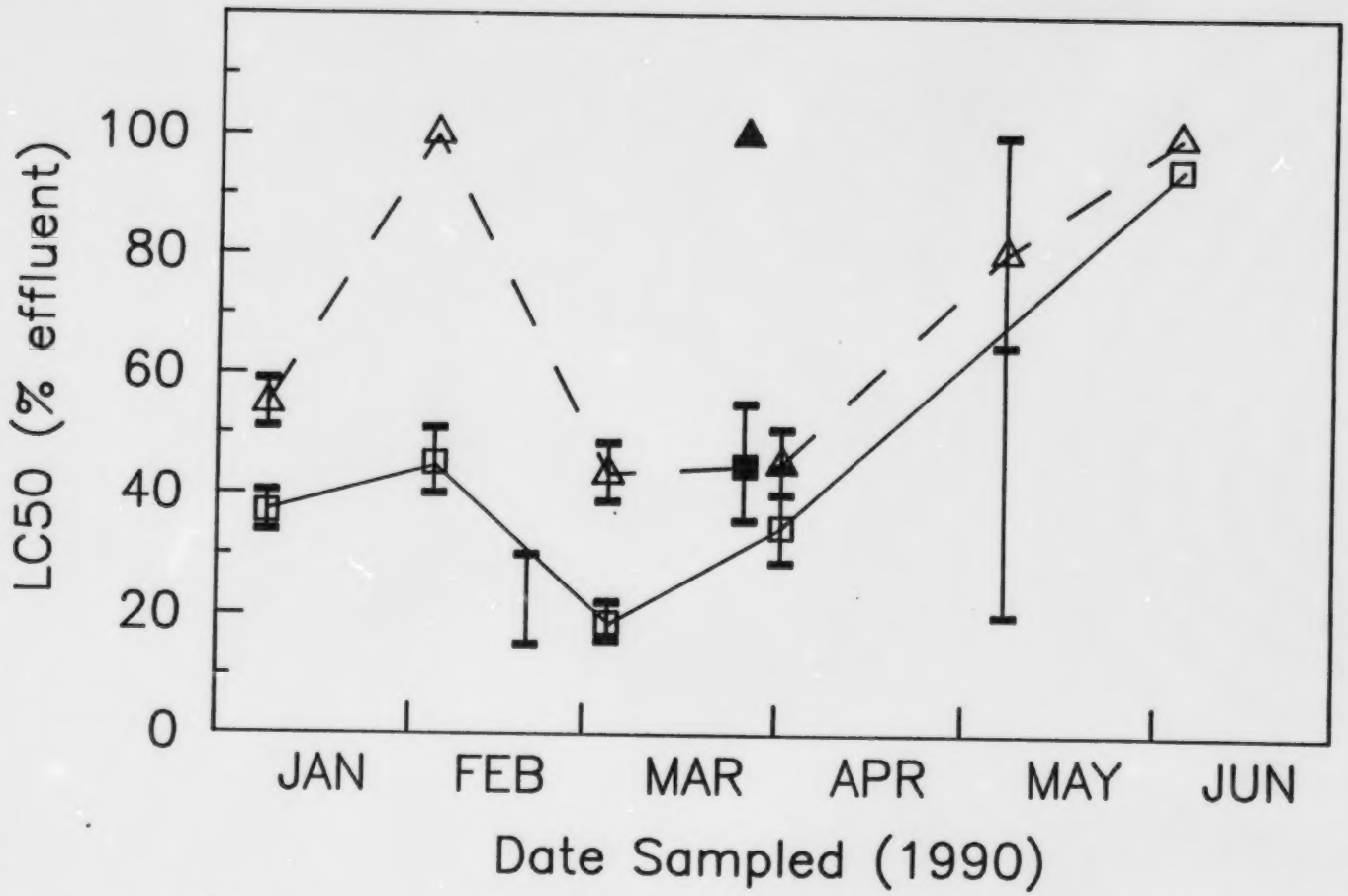

Figure 9. The toxicity of effluent samples from E.B. Eddy Forest Products Ltd., Ottawa, Effluent Discharge. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

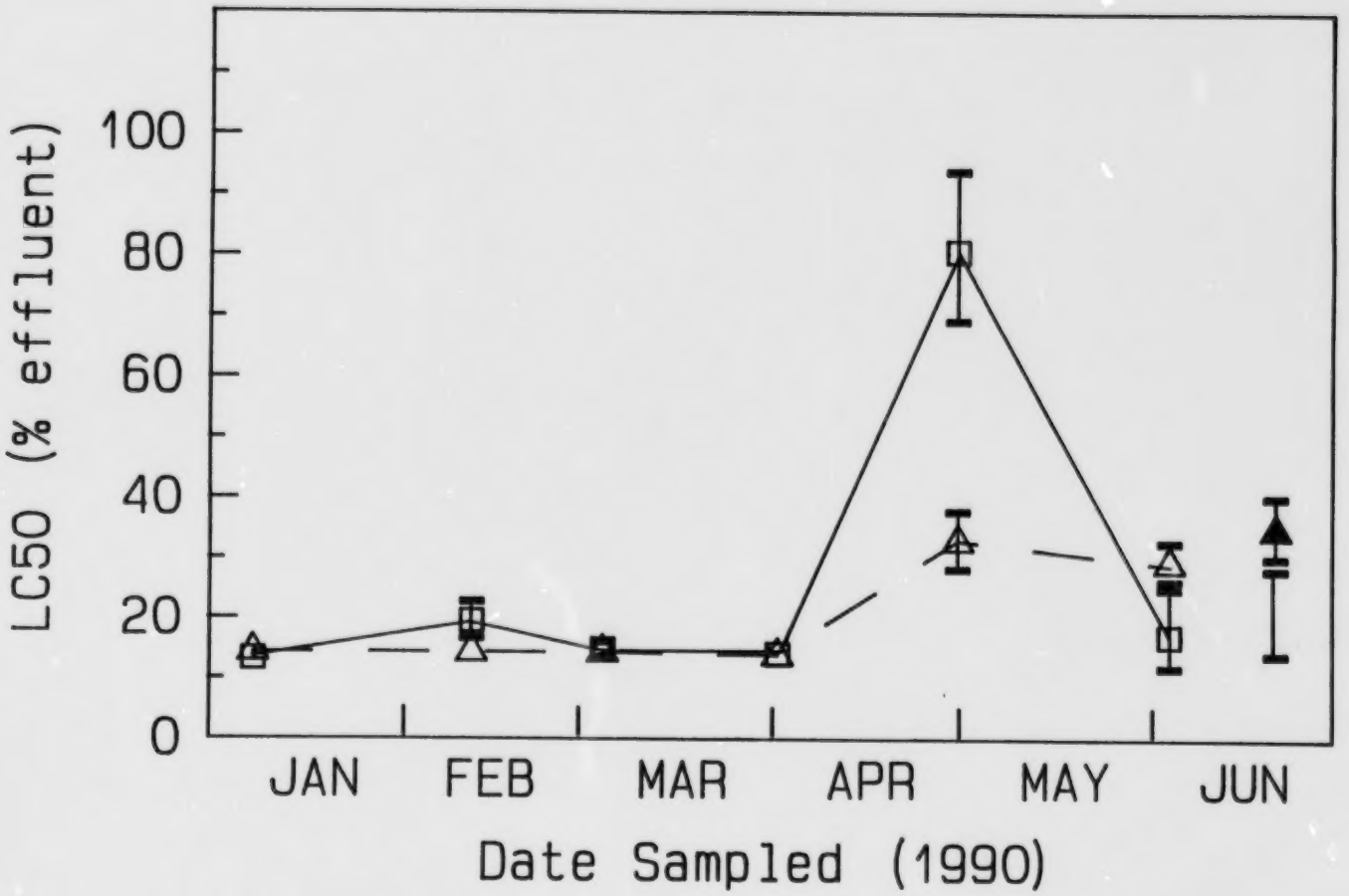

Figure 10. The toxicity of effluent samples from James River-Marathon Ltd., Marathon, Final Effluent PE1. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

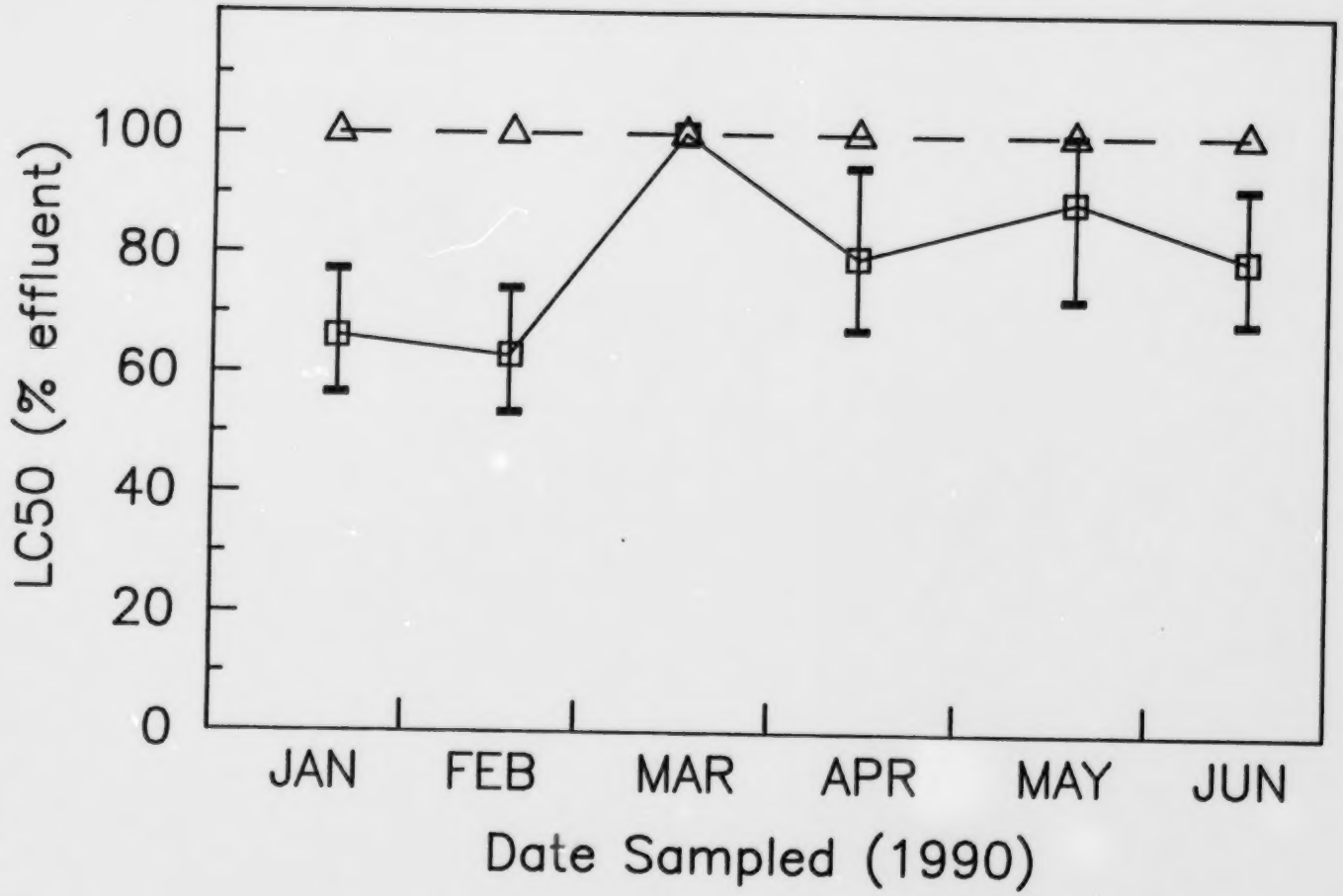

Figure 11. The toxicity of effluent samples from Kimberly-Clark Canada Inc., Terrace Bay, Cooling Water. (Δ Trout, □ *Daphnia magna*).

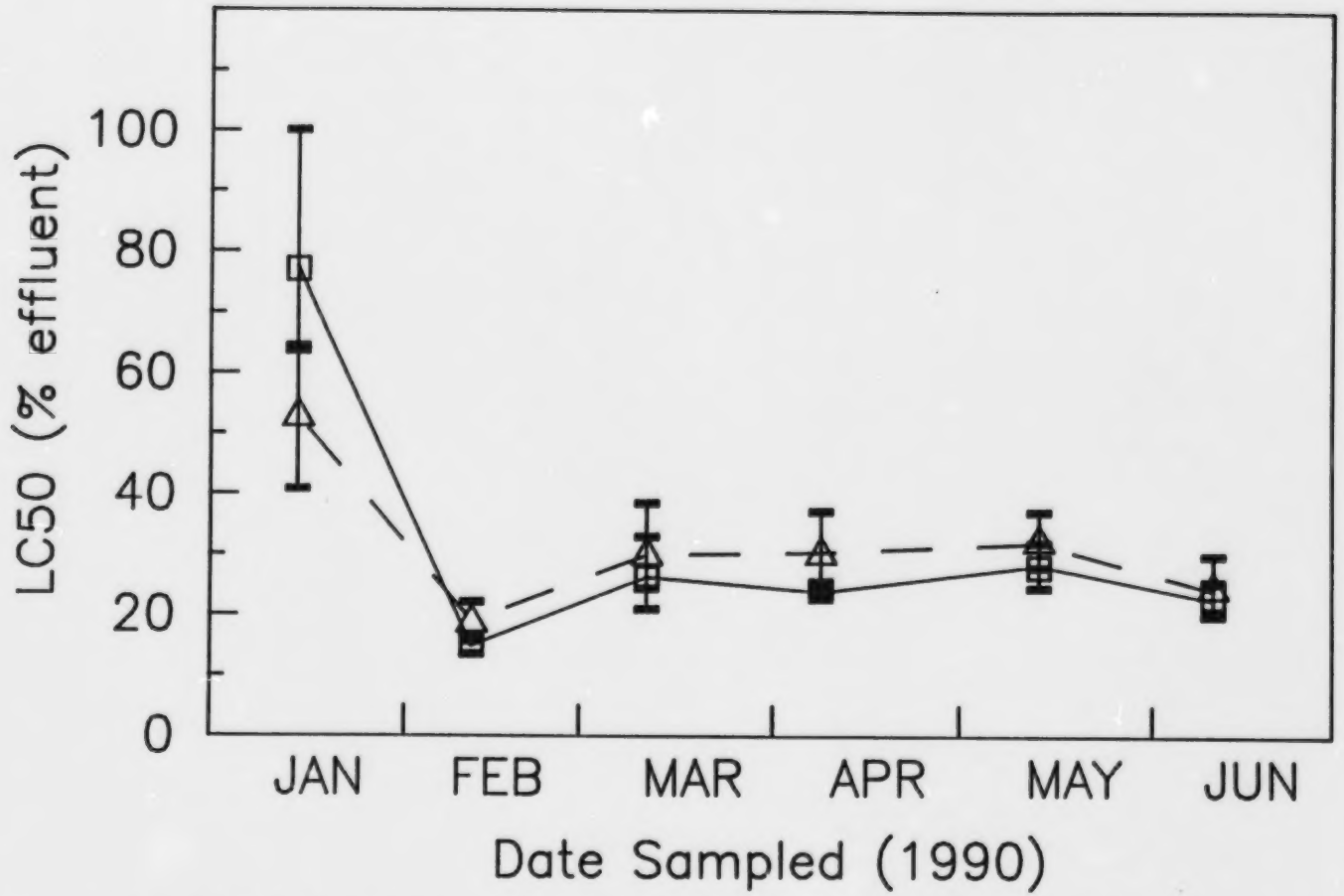

Figure 12. The toxicity of effluent samples from Malette Kraft Pulp and Power Co., Smooth Rock Falls, Final Effluent. (Δ Trout, □ *Daphnia magna*).

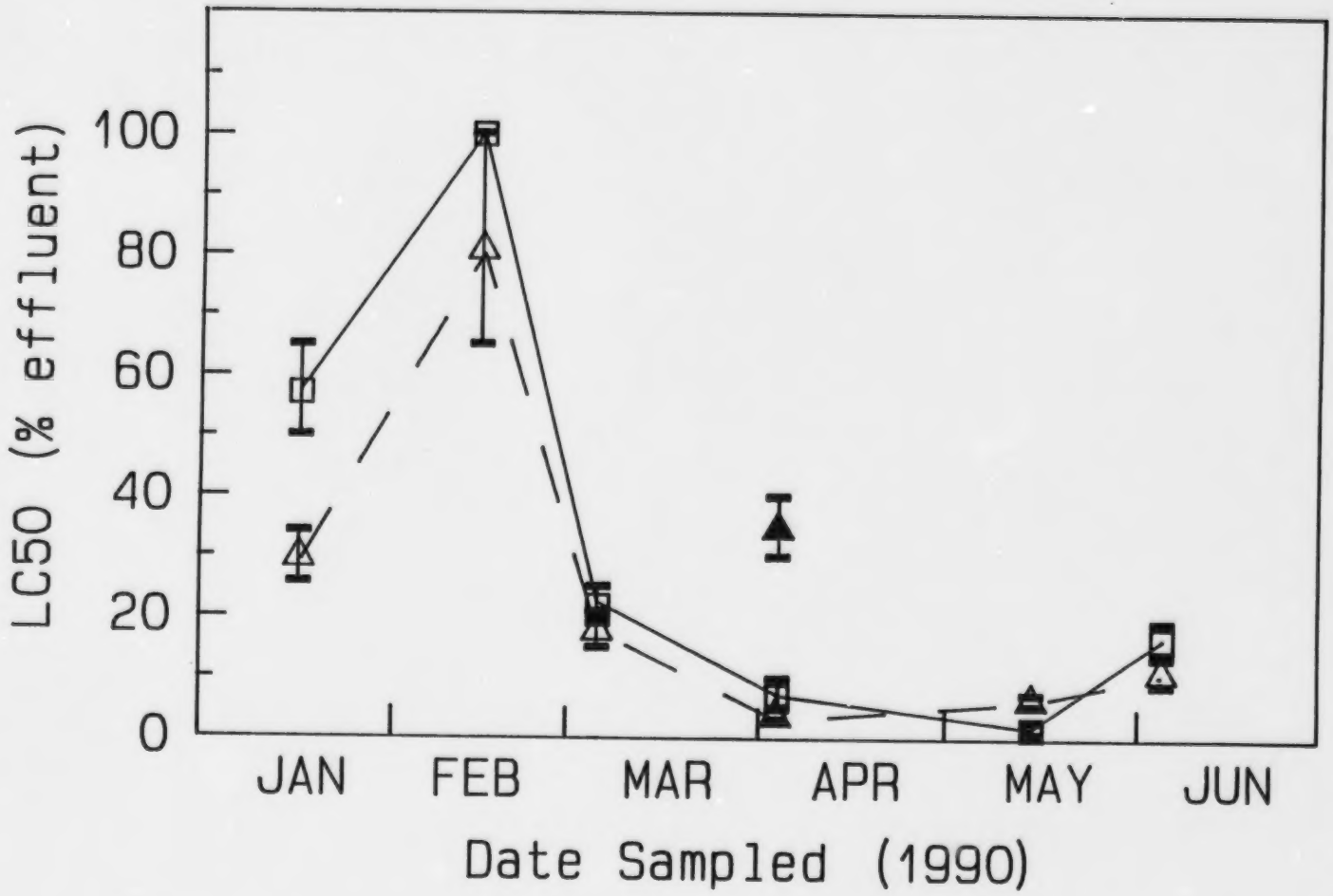

Figure 13. The toxicity of effluent samples from Noranda Forest Inc., Recycled Papers, Thorold, Circular Clarifier. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

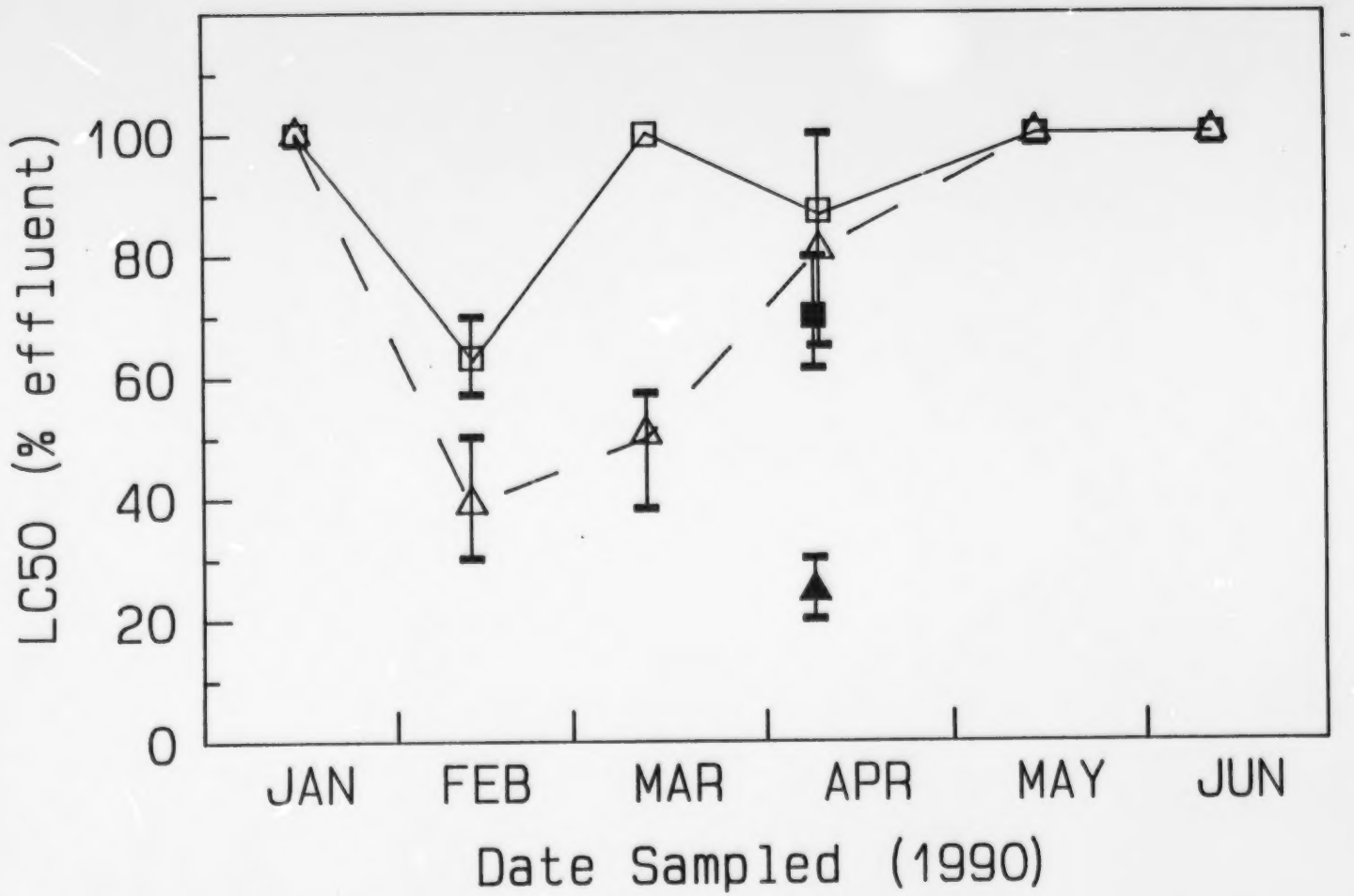

Figure 14. The toxicity of effluent samples from Roman Corp. Ltd., Strathcona, Lagoon #7 To River. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

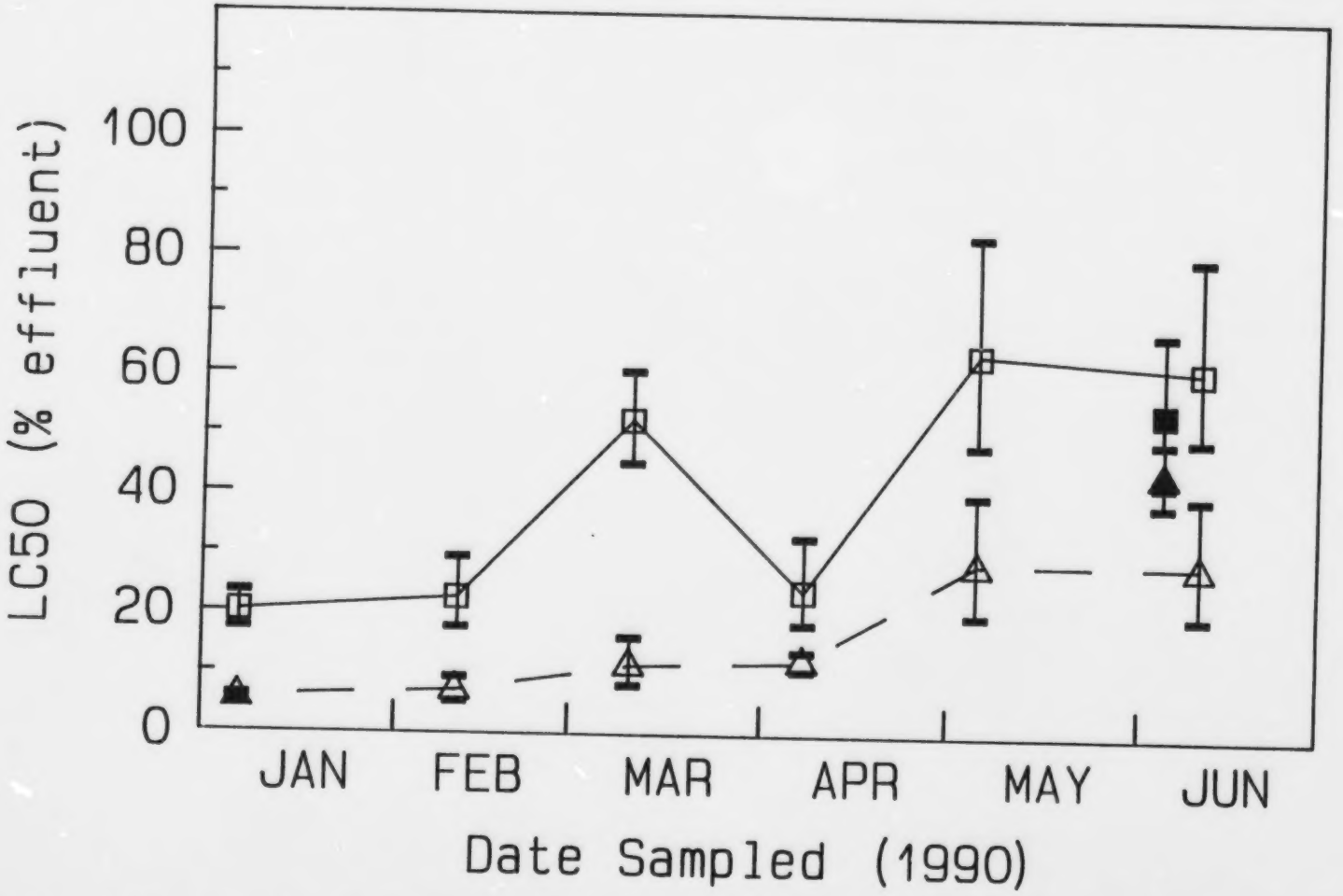

Figure 15. The toxicity of effluent samples from Spruce Falls Power and Paper Co., Kapuskasing, Mill Main Sewer. (Δ Trout, □ *Daphnia magna*). Solid symbols are audit samples.

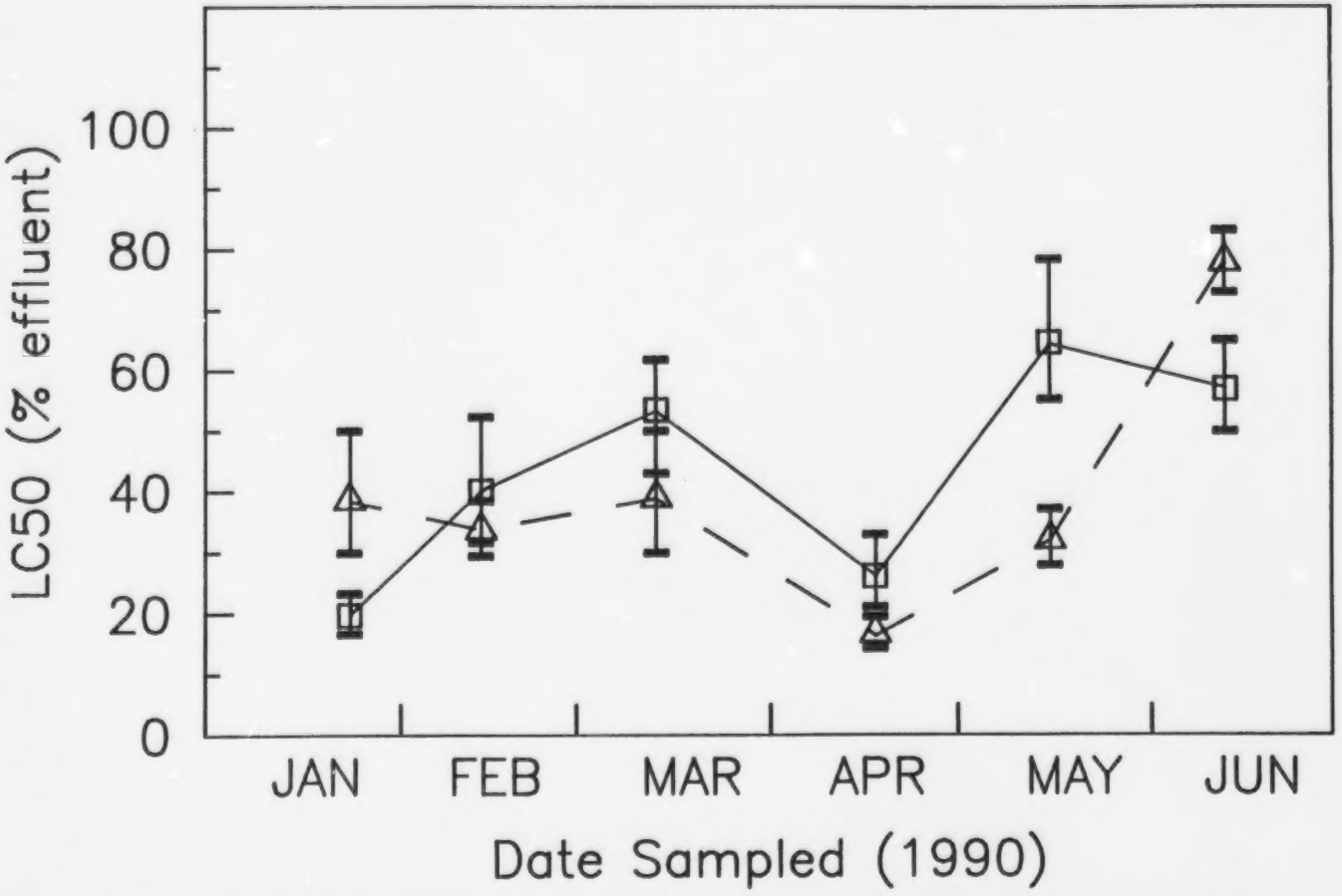

Figure 16. The toxicity of effluent samples from St. Mary's Paper Inc., Sault Ste. Marie, Clear To River. (Δ Trout, □ *Daphnia magna*).

COMPANY: Abitibi-Price Inc., Iroquois Falls
(860403)
(now with Iroquois Falls Division)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Total Outfall effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Iroquois Falls. All six samples were lethal to trout and the LC50s ranged from 6.3 to 7.1 % effluent.

The data for four tests of rainbow trout acute lethality conducted on samples of Cooling Water effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Iroquois Falls. All four samples were nonlethal to trout.

Total Outfall

06900043 sampled: 01/09/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: 100% MORTALITY IN 10% TEST CONCENTRATION.

06900238 sampled: 02/05/90 LC50: 6.3 %
95% fid. limits: 5.3 - 7.3 %
comments: 20% MORTALITY IN 5% TEST CONCENTRATION

06900362 sampled: 03/05/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: COMPLETE MORTALITY IN 10% TEST CONCENTRATION

06900478 sampled: 04/02/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: 100% MORTALITY IN 10% TEST CONCENTRATION

06900578 sampled: 05/07/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: 100% MORTALITY IN 10% TEST CONCENTRATION.

06900684 sampled: 06/04/90 LC50: 6.3 %
95% fid. limits: 5.3 - 7.3 %
comments: 20% MORTALITY IN THE 5% CONCENTRATION

Abitibi-Price Inc. (continued)

Emergency Overflow

C4

C6

Filter Plant Sewer

Rain Gauge

Intake Water

Cooling Water

06900045 sampled: 01/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900240 sampled: 02/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900364 sampled: 03/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900476 sampled: 04/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

COMPANY: Abitibi-Price Inc., Iroquois Falls (860403)
(now with Iroquois Falls Division)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Total Outfall effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Iroquois Falls. All six samples were lethal to Daphnia and the LC50s ranged from 7.1 to 17.6 % effluent.

The data for four tests of Daphnia magna acute lethality conducted on samples of Cooling Water effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Iroquois Falls. No samples were collected in May and June. All four samples were nonlethal to Daphnia.

Total Outfall

06900044 sampled: 01/09/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: 100% MORTALITY IN 10% TEST CONCENTRATION

06900239 sampled: 02/05/90 LC50: 14.0 %
95% fid. limits: 10.0 - 20.0 %
comments: 100% MORTALITY IN 20% TEST CONCENTRATION

06900363 sampled: 03/05/90 LC50: 14.0 %
95% fid. limits: 10.0 - 20.0 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900479 sampled: 04/02/90 LC50: 17.6 %
95% fid. limits: 14.8 - 20.8 %
comments: 60% MORTALITY IN 20% TEST CONCENTRATION

06900579 sampled: 05/07/90 LC50: 14.1 %
95% fid. limits: 10.0 - 20.0 %
comments: 100% MORTALITY IN 20% TEST CONCENTRATION

06900685 sampled: 06/04/90 LC50: 7.6 %
95% fid. limits: 6.6 - 8.6 %
comments: 10% MORTALITY IN THE 10% CONCENTRATION

Emergency Overflow

C4

C6

Filter Plant Sewer

Rain Gauge

Intake Water

Cooling Water

06900046 sampled: 01/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OBSERVED IN 48 HRS

06900241 sampled: 02/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900365 sampled: 03/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900477 sampled: 04/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HOU

COMPANY: Abitibi-Price Inc. Fine Papers Div., Thunder Bay (860106)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for four tests of rainbow trout acute lethality conducted on samples of Lagoon Outfall effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Fine Papers Division, Thunder Bay. Two samples were LC50 > 100 % effluent and two samples were nonlethal. A Ministry audit sample in February was nonlethal.

Lagoon Outfall

06900047 sampled: 01/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900236 sampled: 02/06/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH EFFLUENT

01900018 sampled: 02/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

06900404 sampled: 03/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900474 sampled: 04/04/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH EFFLUENT

C3

C4

Rain Gauge

Intake Water

C2

COMPANY: Abitibi-Price Inc. Fine Papers Div., Thunder Bay (860106)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Lagoon Outfall effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Fine Papers Division, Thunder Bay. One sample was LC50 > 100 % effluent and five samples were nonlethal. A Ministry audit sample in February was lethal and the LC50 was < 5.0 % effluent.

Lagoon Outfall

06900048 sampled: 01/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900237 sampled: 02/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

02900018 sampled: 02/20/90 LC50: 0.0 - 5.0 %
95% fid. limits: 0.0 - 5.0 %
comments: MISA Audit/high biological oxygen demand

06900405 sampled: 03/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900475 sampled: 04/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HOU

06900580 sampled: 05/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900682 sampled: 06/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED DURING TE

C3

COMPANY: Abitibi-Price Inc. Fort William, Thunder Bay (860205)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Main Sewer Lagoon #1 effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Fort William Division, Thunder Bay. All six samples were lethal to trout and the LC50s ranged from 5.6 to 12.3 % effluent.

The data for six tests of rainbow trout acute lethality conducted on samples of Bark Lagoon #2 effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Fort William Division, Thunder Bay. All six samples were lethal to trout and the LC50s ranged from 1.8 to 7.1 % effluent.

Main Sewer Lagoon #1

06900041 sampled: 01/09/90 LC50: 11.5 %
95% fid. limits: 9.3 - 14.0 %
comments: 100% MORTALITY IN 20% TEST CONCENTRATION

06900244 sampled: 02/05/90 LC50: 11.5 %
95% fid. limits: 9.3 - 14.0 %
comments: 30% MORTALITY IN 10% TEST CONCENTRATION

06900353 sampled: 03/05/90 LC50: 5.6 %
95% fid. limits: 4.6 - 6.7 %
comments: 40% MORTALITY IN 5% TEST CONCENTRATION

06900472 sampled: 04/03/90 LC50: 7.4 %
95% fid. limits: 5.7 - 9.4 %
comments: 90% MORTALITY IN 10% TEST CONCENTRATION

06900574 sampled: 05/08/90 LC50: 8.7 %
95% fid. limits: 7.1 - 10.6 %
comments: 70% MORTALITY IN 10% TEST CONCENTRATION

06900679 sampled: 06/05/90 LC50: 12.3 %
95% fid. limits: 10.3 - 14.6 %
comments: 20% MORTALITY IN THE 10% CONCENTRATION

Bark Lagoon #2

06900049 sampled: 01/09/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: 100% MORTALITY IN 10% TEST CONCENTRATION

06900242 sampled: 02/05/90 LC50: 3.2 %
95% fid. limits: 2.7 - 3.7 %
comments: 40% MORTALITY IN 3% TEST CONCENTRATION

06900355 sampled: 03/05/90 LC50: 1.8 %
95% fid. limits: 1.5 - 2.1 %
comments: 60% MORTALITY IN 2% TEST CONCENTRATION

06900470 sampled: 04/03/90 LC50: 3.9 %
95% fid. limits: 3.0 - 5.0 %
comments: 100% MORTALITY IN 5% TEST CONCENTRATION

06900572 sampled: 05/08/90 LC50: 5.1 %
95% fid. limits: 4.0 - 6.7 % slope: 6.7
comments: 40% MORTALITY IN 5% TEST CONCENTRATION

06900677 sampled: 06/05/90 LC50: 3.6 %
95% fid. limits: 3.0 - 4.1 %
comments: 10% MORTALITY IN THE 3% CONCENTRATION

Storm Drainage E

Storm Drainage F

Rain Gauge

Intake Water

Main Sewer Lagoon # 2

COMPANY: Abitibi-Price Inc. Fort William, Thunder Bay (860205)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Main Sewer Lagoon #1 effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Fort William Division, Thunder Bay. All six samples were lethal to Daphnia and the LC50s ranged from 16.7 to 26.9 % effluent.

The data for six tests of Daphnia magna acute lethality conducted on samples of Bark Lagoon #2 effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Fort William Division, Thunder Bay. All six samples were lethal to Daphnia and the LC50s ranged from 2.6 to 14.0 % effluent.

Main Sewer Lagoon #1

06900042 sampled: 01/09/90 LC50: 18.4 %
95% fid. limits: 13.7 - 22.4 %
comments: 70% MORTALITY IN 20% TEST CONCENTRATION

06900245 sampled: 02/05/90 LC50: 26.9 %
95% fid. limits: 23.9 - 30.1 %
comments: 80% MORTALITY IN 30% TEST CONCENTRATION

06900354 sampled: 03/05/90 LC50: 16.7 %
95% fid. limits: 14.2 - 19.6 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900473 sampled: 04/03/90 LC50: 19.7 %
95% fid. limits: 16.5 - 23.3 %
comments: 40% MORTALITY IN 20% TEST CONCENTRATION

06900575 sampled: 05/08/90 LC50: 22.5 %
95% fid. limits: 17.6 - 26.8 % slope: 10.3
comments: 90% MORTALITY IN 30% TEST CONCENTRATION

06900680 sampled: 06/05/90 LC50: 16.8 %
95% fid. limits: 11.6 - 23.2 % slope: 3.2
comments: 40% MORTALITY IN THE 10% CONCENTRATION

Bark Lagoon #2

06900050 sampled: 01/09/90 LC50: 8.7 %
95% fid. limits: 6.3 - 12.2 %
comments: 100% MORTALITY IN 20% CONCENTRATION

06900243 sampled: 02/05/90 LC50: 14.0 %
95% fid. limits: 10.0 - 20.0 %
comments: 100% MORTALITY IN 20% TEST CONCENTRATION

06900356 sampled: 03/05/90 LC50: 2.6 %
95% fid. limits: 2.0 - 3.3 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900471 sampled: 04/03/90 LC50: 8.1 %
95% fid. limits: 6.1 - 10.9 %
comments: 60% MORTALITY IN 10% TEST CONCENTRATION

06900573 sampled: 05/08/90 LC50: 12.4 %
95% fid. limits: 9.1 - 16.0 % slope: 5.3
comments: 30% MORTALITY IN 10% TEST CONCENTRATION

06900678 sampled: 06/05/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: 100% MORTALITY IN THE 10% CONCENTRATION

Storm Drainage E

Storm Drainage F

Rain Gauge

Intake Water

Main Sewer Lagoon # 2

COMPANY: Abitibi-Price Inc. Thunder Bay Div., Thunder Bay (860007)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Primary Lagoon Outfall #2 effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Thunder Bay Division, Thunder Bay. All six samples were lethal to trout and the LC50s ranged from 14.9 to 24.5 % effluent. A Ministry audit sample in February was lethal and the LC50 was 33.5 % effluent.

Primary Lagoon Outfall #2

06900109 sampled: 01/15/90 LC50: 14.9 %
95% fid. limits: 13.5 - 16.6 %
comments: 90% MORTALITY IN 20% TEST CONCENTRATION

06900234 sampled: 02/05/90 LC50: 14.9 %
95% fid. limits: 13.4 - 16.5 %
comments: 90% MORTALITY IN 20% TEST CONCENTRATION

01900026 sampled: 02/28/90 LC50: 33.5 %
95% fid. limits: 31.3 - 35.7 %
comments: MISA Audit

06900360 sampled: 03/05/90 LC50: 20.8 %
95% fid. limits: 17.7 - 24.4 %
comments: 30% MORTALITY IN 20% TEST CONCENTRATION

06900488 sampled: 04/03/90 LC50: 17.6 %
95% fid. limits: 14.8 - 20.8 %
comments: 60% MORTALITY IN 20% TEST CONCENTRATION

06900564 sampled: 05/07/90 LC50: 23.2 %
95% fid. limits: 20.8 - 25.7 %
comments: 100% MORTALITY IN 30% TEST CONCENTRATION

06900686 sampled: 06/04/90 LC50: 24.5 %
95% fid. limits: 20.0 - 30.0 %
comments: 100% MORTALITY IN THE 20% CONCENTRATION

P4

COMPANY: Abitibi-Price Inc. Thunder Bay Div., Thunder Bay (860007)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Primary Lagoon Outfall #2 effluent collected between January and June 1990 were provided by Abitibi-Price Inc., Thunder Bay Division, Thunder Bay. All six samples were lethal to Daphnia and the LC50s ranged from 25.1 to 39.0 % effluent. A Ministry audit sample in February was lethal and the LC50 was 26.7 % effluent.

Primary Lagoon Outfall #2

06900110 sampled: 01/15/90 LC50: 32.2 %
95% fid. limits: 27.9 - 37.1 %
comments: 40% MORTALITY IN 30% TEST CONCENTRATION

06900235 sampled: 02/05/90 LC50: 26.9 %
95% fid. limits: 23.9 - 30.1 %
comments: 80% MORTALITY IN 30% TEST CONCENTRATION

02900026 sampled: 02/27/90 LC50: 26.7 %
95% fid. limits: 22.1 - 32.3 %
comments: MISA Audit/high biological oxygen demand

06900361 sampled: 03/05/90 LC50: 25.1 %
95% fid. limits: 19.9 - 31.5 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900489 sampled: 04/03/90 LC50: 39.0 %
95% fid. limits: 30.0 - 50.0 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION

06900565 sampled: 05/07/90 LC50: 33.8 %
95% fid. limits: 29.5 - 38.5 %
comments: 30% MORTALITY IN 30% TEST CONCENTRATION

06900687 sampled: 06/04/90 LC50: 37.0 %
95% fid. limits: 33.9 - 40.3 %
comments: 10% MORTALITY IN THE 30% CONCENTRATION

P4

COMPANY: Beaver Wood Fibre Company Limited, Thorold (1620004)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Process Effluent P-1 collected between January and June 1990 were provided by Beaver Wood Fibre Co. Ltd., Thorold. Five samples were nonlethal and one sample was LC50 > 100 % effluent.

The data for five tests of rainbow trout acute lethality conducted on samples of Spill P-2 (CW) collected between January and June 1990 were provided by Beaver Wood Fibre Co. Ltd., Thorold. Four samples were nonlethal to trout and one sample was LC50 > 100 % effluent.

Process Effluent P-1

06900133 sampled: 01/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900281 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900396 sampled: 03/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH EFFLUENT

06900515 sampled: 04/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900598 sampled: 05/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900736 sampled: 06/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Intake Water

Spill P-2 (CW)

06900331 sampled: 03/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900438 sampled: 03/22/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% MORTALITY IN FULL STRENGTH EFFLUENT

06900513 sampled: 04/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900600 sampled: 05/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900734 sampled: 06/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Spill P-2 (EO)

COMPANY: Beaver Wood Fibre Company Limited, Thorold (1620004)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Process Effluent P-1 collected between January and June 1990 were provided by Beaver Wood Fibre Co. Ltd., Thorold. Two samples were lethal to Daphnia and the LC50s were 51.0 and 37.0 % effluent. Four samples were nonlethal.

The data for five tests of Daphnia magna acute lethality conducted on samples of Spill P-2 (CW) effluent collected between January and June 1990 were provided by Beaver Wood Fibre Co. Ltd., Thorold. All five samples were nonlethal to Daphnia.

Process Effluent P-1

06900132 sampled: 01/23/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OBSERVED IN 48 HRS

06900282 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900397 sampled: 03/13/90 LC50: 51.0 %
95% fid. limits: 42.2 - 63.3 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900516 sampled: 04/10/90 LC50: 37.0 %
95% fid. limits: 25.7 - 48.6 % slope: 3.5
comments: 60% MORTALITY 30% TEST CONCENTRATION

06900599 sampled: 05/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900737 sampled: 06/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED DURING TE

Intake Water

Spill P-2 (CW)

06900332 sampled: 03/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900439 sampled: 03/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900514 sampled: 04/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HOU

06900601 sampled: 05/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900735 sampled: 06/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED DURING TE

Spill P-2 (EO)

COMPANY: Boise Cascade Canada Ltd., Fort Frances (870105)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Total Mill Final Effluent collected between January and June 1990 were provided by Boise Cascade Canada, Ltd., Fort Frances. All six samples were lethal to trout and the LC50s ranged from 26.7 to 77.0 % effluent.

The data for four tests of rainbow trout acute lethality conducted on samples of Storm Sewer CW #14 collected between January and June 1990 were provided by Boise Cascade Canada Ltd., Fort Frances. All four samples were nonlethal.

The data for four tests of rainbow trout acute lethality conducted on samples of Storm Sewer CW #18 collected between January and June 1990 were provided by Boise Cascade Canada Ltd., Fort Frances. All four samples were nonlethal.

Total Mill Final Effluent

12900001 sampled: 01/09/90 LC50: 26.7 %
95% fid. limits: 17.2 - 41.3 %
comments:

12900018 sampled: 02/06/90 LC50: 54.8 %
95% fid. limits: 30.0 - 100.0 %
comments:

12900038 sampled: 03/06/90 LC50: 42.4 %
95% fid. limits: 0.0 - 0.0 %
comments: fish in 100%conc. were stressed at 4h obs.

12900051 sampled: 04/09/90 LC50: 77.0 %
95% fid. limits: 74.9 - 79.0 %
comments:

12900064 sampled: 05/07/90 LC50: 70.1 %
95% fid. limits: 46.0 - 106.0 %
comments:

12900083 sampled: 06/05/90 LC50: 76.6 %
95% fid. limits: 74.1 - 79.3 %
comments:

Wood Storage Drainage

Storm Drainage

Rain Gauge

Intake Water

Storm sewers CW # 14

12900006 sampled: 01/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

12900023 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL

12900039 sampled: 03/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL

12900082 sampled: 06/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL

Storm Sewer CW # 18

12900007 sampled: 01/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

12900022 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL

12900037 sampled: 03/06/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Not Lethal

12900081 sampled: 06/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL

Vacuum Seal EffluentP7/S7

COMPANY: Boise Cascade Canada Ltd., Fort Frances (870105)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for three tests of Daphnia magna acute lethality conducted on samples of Total Mill Final Effluent collected between January and June 1990 were provided Boise Cascade Canada Ltd., Fort Frances. One sample was lethal and the LC50 was 86.0 % effluent. Two samples were LC50 > 100 % effluent.

The data for three tests of Daphnia magna acute lethality conducted on samples of Storm Sewer CW #14 effluent collected between January and June 1990 were provided by Boise Cascade Canada Ltd., Fort Frances. One sample was nonlethal and two samples were LC50 > 100 % effluent.

The data for three tests of Daphnia magna acute lethality conducted on samples of Storm Sewer CW #18 effluent collected between January and June 1990 were provided by Boise Cascade Canada Ltd., Fort Frances. All three samples were LC50 > 100 % effluent.

Total Mill Final Effluent

12900058 sampled: 04/09/90 LC50: 86.0 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900072 sampled: 05/07/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 GREATER THAN 100%

12900088 sampled: 06/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Wood Storage Drainage

Storm Drainage

Rain Gauge

Intake Water

Storm sewers CW # 14

12900057 sampled: 04/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL BUT ONE DIED IN 6%AND ONE IN 14%

12900073 sampled: 05/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL

12900089 sampled: 06/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Storm Sewer CW # 18

12900056 sampled: 04/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL BUT ONE DIED IN 26%

12900071 sampled: 05/07/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 GREATER THAN 100%

12900090 sampled: 06/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

Vacuum Seal EffluentP7/S7

Aeration Lagoon P2/S2

COMPANY: Boise Cascade Canada Ltd., Kenora (870006)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Final Effluent collected between January and June 1990 were provided by Boise Cascade Canada Ltd., Kenora. All six samples were lethal to trout and the LC50s ranged from 1.7 to 4.8 % effluent. A Ministry audit sample in June was lethal and the LC50 was 6.3 % effluent.

Final Effluent

12900002 sampled: 01/10/90 LC50: 1.7 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900019 sampled: 02/07/90 LC50: 1.7 %
95% fid. limits: 1.0 - 3.0 %
comments:

12900040 sampled: 03/07/90 LC50: 4.8 %
95% fid. limits: 3.2 - 7.1 %
comments: FISH WERE STRESSED AT 1h OBS. IN 10%-100%CON

12900052 sampled: 04/11/90 LC50: 1.7 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900063 sampled: 05/09/90 LC50: 3.7 %
95% fid. limits: 2.2 - 6.1 %
comments:

12900084 sampled: 06/06/90 LC50: 2.9 %
95% fid. limits: 1.8 - 4.6 %
comments:

01900106 sampled: 06/06/90 LC50: 6.3 %
95% fid. limits: 5.1 - 7.8 %
comments: MISA Audit

East Yard Drainage Ditch

COMPANY: Boise Cascade Canada Ltd., Kenora (870006)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for five tests of Daphnia magna acute lethality conducted on samples of Final Effluent collected between January and June 1990 were provided by Boise Cascade Canada Ltd., Kenora. All five samples were lethal to Daphnia and the LC50s ranged from 6.4 to 20.3 % effluent. A Ministry audit sample in June was lethal and the LC50 was 5.0 to 15.0 % effluent.

Final Effluent

12900012 sampled: 01/10/90 LC50: 9.0 %
95% fid. limits: 6.1 - 12.3 % slope: 5.0
comments: * HARDNESS ADDED

12900032 sampled: 02/21/90 LC50: 6.4 %
95% fid. limits: 5.0 - 8.2 %
comments: S-K METHOD USING ALPHA=25

12900059 sampled: 04/11/90 LC50: 9.2 %
95% fid. limits: 0.0 - 0.0 %
comments: DATA CORRECTED (ABBOT'S)

12900068 sampled: 05/09/90 LC50: 20.3 %
95% fid. limits: 15.3 - 26.8 %
comments:

02900106 sampled: 06/06/90 LC50: 5.0 - 15.0 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Low pH,D.O.; High Conductivity

12900091 sampled: 06/06/90 LC50: 9.2 %
95% fid. limits: 7.9 - 10.5 %
comments:

East Yard Drainage Ditch

Rain Gauge

Intake Water

COMPANY: Canadian Pacific Forest Products, Dryden (840108)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for eight tests of rainbow trout acute lethality conducted on samples of Final Effluent collected between January and June 1990 were provided by Canadian Pacific Forest Products Ltd., Dryden. Five samples were lethal to trout and the the LC50s ranged from 51.0 to 77.5 % effluent. One sample was LC50 > 100 % effluent and two samples were non-lethal. A Ministry audit sample in April was lethal and the LC50 was 80.6 % effluent.

Final Effluent

12900003 sampled: 01/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

04900059 sampled: 01/09/90 LC50: 51.0 %
95% fid. limits: 0.0 - 0.0 %
comments: confidence limits unreliable

12900008 sampled: 01/22/90 LC50: 63.7 %
95% fid. limits: 52.2 - 77.6 %
comments:

12900017 sampled: 02/06/90 LC50: 54.8 %
95% fid. limits: 30.0 - 100.0 %
comments:

12900036 sampled: 03/06/90 LC50: 77.5 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900050 sampled: 04/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL

01900070 sampled: 04/18/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: MISA Audit

12900062 sampled: 05/07/90 LC50: 77.5 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900080 sampled: 06/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL

COMPANY: Canadian Pacific Forest Products, Dryden (840108)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for seven tests of Daphnia magna acute lethality conducted on samples of Final Effluent collected between January and June 1990 were provided by Canadian Pacific Forest Products Ltd., Dryden. Five samples were LC50 > 100 % effluent. and two samples were nonlethal. A Ministry audit sample in April was nonlethal.

Final Effluent

12900009 sampled: 01/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: TEST RESULTS NOT RELIABLE. TEST REPEATED

04900059 sampled: 01/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

12900016 sampled: 01/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: *HARDNESS ADDED. TEST REPEATS 12900009

12900033 sampled: 02/19/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 GREATER THAN 100%

12900055 sampled: 04/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

02900070 sampled: 04/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; High Conductivity

12900067 sampled: 05/07/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: DATA CORRECTED (ABBOT'S)

12900087 sampled: 06/04/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

COMPANY: Canadian Pacific Forest Products, Thunder Bay (840009)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for eight tests of rainbow trout acute lethality conducted on samples of Combined Mill Outfall effluent collected between January and June 1990 were provided by Canadian Pacific Forest Products Ltd., Thunder Bay. All eight samples were lethal to trout and the LC50s ranged from 5.5 to 54.8 % effluent. A Ministry audit sample in May was lethal and the LC50 was 67.1 % effluent.

The data for eight tests of rainbow trout acute lethality conducted on samples of Clean Water Outfall effluent collected between January and June 1990 were provided by Canadian Pacific Forest Products Ltd., Thunder Bay. Four samples were LC50 > 100 % effluent and two samples were nonlethal. Two samples were lethal to trout and the LC50s were 54.8 and 17.3 % effluent. A Ministry audit sample in May was nonlethal.

Combined Mill Outfall

12900004 sampled: 01/09/90 LC50: 5.5 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900021 sampled: 02/05/90 LC50: 54.8 %
95% fid. limits: 30.0 - 100.0 %
comments:

12900042 sampled: 03/05/90 LC50: 40.8 %
95% fid. limits: 37.6 - 44.3 %
comments: FISH IN 100% CONC WERE VERY STRESSED AT 4h

04900485 sampled: 03/05/90 LC50: 28.1 %
95% fid. limits: 25.2 - 31.3 %
comments:

12900054 sampled: 04/09/90 LC50: 37.8 %
95% fid. limits: 27.3 - 52.3 %
comments:

04900827 sampled: 04/09/90 LC50: 29.1 %
95% fid. limits: 26.1 - 32.5 %
comments:

12900066 sampled: 05/07/90 LC50: 40.3 %
95% fid. limits: 27.9 - 57.9 %
comments:

01900087 sampled: 05/09/90 LC50: 67.1 %
95% fid. limits: 58.2 - 77.4 %
comments: MISA Audit

12900086 sampled: 06/04/90 LC50: 40.8 %
95% fid. limits: 37.6 - 44.3 %
comments:

Clean Water Outfall

12900005 sampled: 01/09/90 LC50: 54.8 %
95% fid. limits: 0.0 - 0.0 %
comments:

12900020 sampled: 02/05/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL

04900484 sampled: 03/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 4 dead at 96 hrs. at 100% conc.

12900041 sampled: 03/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: Spearman-Karber didn't work

04900826 sampled: 04/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 2 dead @ 100%; 1 dead @ 65%

12900053 sampled: 04/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NOT LETHAL

12900065 sampled: 05/07/90 LC50: 17.3 %
95% fid. limits: 0.0 - 0.0 %
comments:

01900086 sampled: 05/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

12900085 sampled: 06/04/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

COMPANY: Canadian Pacific Forest Products, Thunder Bay (840009)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for eight tests of Daphnia magna acute lethality conducted on samples of Combined Mill Outfall effluent collected between January and June 1990 were provided by Canadian Pacific Forest Products Ltd., Thunder Bay. One sample was LC50 > 100 % effluent. Seven samples were lethal to Daphnia and the LC50s ranged from 44.2 to 80.6 % effluent. A Ministry audit sample in May was LC50 > 100 % effluent.

The data for eight tests of Daphnia magna acute lethality conducted on samples of Clean Water Outfall effluent collected between January and June 1990 were provided by Canadian Pacific Forest Products Ltd., Thunder Bay. One sample was LC50 > 100 % effluent. Seven samples were lethal to Daphnia and the LC50s ranged from 2.4 to 35.8 % effluent. A Ministry audit sample in May was lethal and the LC50 was 60 to 100 % effluent.

Combined Mill Outfall

12900011 sampled: 01/09/90 LC50: 59.2 %
95% fid. limits: 45.9 - 76.3 %
comments: * HARDNESS ADDED

12900028 sampled: 02/05/90 LC50: 76.7 %
95% fid. limits: 58.1 - 105.7 % slope: 6.7
comments: DATA CORRECTED FOR 10% CONTROL MORTALITY.

12900035 sampled: 02/19/90 LC50: 63.3 %
95% fid. limits: 49.5 - 81.0 %
comments: S-K METHOD USING ALPHA=10

04900485 sampled: 03/05/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: confidence limits unreliable

12900061 sampled: 04/09/90 LC50: 69.4 %
95% fid. limits: 65.9 - 73.2 %
comments:

04900827 sampled: 04/09/90 LC50: 44.2 %
95% fid. limits: 30.0 - 65.0 %
comments: confidence limits unreliable

12900070 sampled: 05/07/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 GREATER THAN 100%

02900087 sampled: 05/09/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; High Conductivity\Low D.O.

12900093 sampled: 06/04/90 LC50: 76.7 %
95% fid. limits: 30.8 - ***.* % slope: 0.9
comments: upper conf. limit by probit 2.86 x 10E13 %

Clean Water Outfall

12900010 sampled: 01/09/90 LC50: 32.8 %
95% fid. limits: 26.2 - 41.0 %
comments: * HARDNESS ADDED

12900027 sampled: 02/05/90 LC50: 32.0 %
95% fid. limits: 17.3 - 70.3 % slope: 1.6
comments: DATA CORRECTED FOR 10% CONTROL MORTALITY

12900034 sampled: 02/19/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 GREATER THAN 100%

04900484 sampled: 03/05/90 LC50: 33.0 %
95% fid. limits: 0.0 - 0.0 %
comments: confidence limits unreliable

12900060 sampled: 04/09/90 LC50: 2.4 %
95% fid. limits: 0.0 - 0.0 %
comments:

04900826 sampled: 04/09/90 LC50: 3.4 %
95% fid. limits: 2.5 - 4.4 %
comments: A-test <10%

12900069 sampled: 05/07/90 LC50: 8.7 %
95% fid. limits: 7.9 - 9.6 %
comments: VARIANCE MAY BE UNDERESTIMATED

02900086 sampled: 05/09/90 LC50: 60.0 - 100.0 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; High Conductivity

12900092 sampled: 06/04/90 LC50: 35.8 %
95% fid. limits: 23.9 - 56.0 % slope: 2.7
comments:

COMPANY: Domtar Inc., Cornwall
(140301)
(now with Fine Papers Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for one test of rainbow trout acute lethality conducted on a sample of Total Mill Effluent collected between January and June 1990 were provided by Domtar Inc., Cornwall. The sample was lethal, and the LC50 was 65.7 % effluent. A Ministry audit sample in March was LC50 > 100 % effluent.

Total Mill Effluent

01900054 sampled: 03/27/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

13900022 sampled: 06/13/90 LC50: 65.7 %
95% fid. limits: 50.0 - 100.0 %
comments:

Clarifier Effluent

By-Pass Sewer

Diversion Manhole

Intake Water

COMPANY: Domtar Inc., Cornwall
(140301)
(now with Fine Papers Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Total Mill Effluent collected between January and June 1990 were provided by Domtar Inc., Cornwall. Two samples were LC50 > 100 % effluent and two samples were nonlethal. Two samples were lethal to Daphnia and the LC50s were 39.0 and 26.7 % effluent. A Ministry audit sample in March was lethal and the LC50 was 75.6 % effluent.

Total Mill Effluent

13900002 sampled: 01/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900007 sampled: 02/14/90 LC50: 39.0 %
95% fid. limits: 30.0 - 50.0 %
comments:

13900010 sampled: 03/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

02900054 sampled: 03/27/90 LC50: 75.6 %
95% fid. limits: 72.1 - 79.4 %
comments: Low DO; high conductivity; MISA Audit sample

13900014 sampled: 04/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900019 sampled: 05/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900022 sampled: 06/13/90 LC50: 26.7 %
95% fid. limits: 10.0 - 30.0 %
comments:

Clarifier Effluent

COMPANY: Domtar Inc., Red Rock
(140202)
(now with Containerboard Division)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for one test of rainbow trout acute lethality conducted on a sample of Total Mill Outfall Stream effluent collected between January and June 1990 were provided by Domtar Inc., Red Rock. The sample was lethal, and the LC50 was 87.3 % effluent. A Ministry audit sample in June was lethal and the LC50 was 56.3 % effluent.

Total Mill Outfall Stream

13900024 sampled: 06/12/90 LC50: 87.3 %
95% fid. limits: 65.0 - 100.0 %
comments:

01900108 sampled: 06/12/90 LC50: 56.3 %
95% fid. limits: 48.4 - 65.5 %
comments: MISA Audit

Storm Drainage Stream

Rain Gauge

Intake Water

Storm Water Lanfill Site

COMPANY: Domtar Inc., Red Rock
(140202)
(now with Containerboard Division)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Total Mill Outfall Stream effluent collected between January and June 1990 were provided by Domtar Inc., Red Rock. Three samples were LC50 > 100 % effluent and one sample was nonlethal. Two samples were lethal to Daphnia and the LC50s were 38.2 and 81.0 % effluent. A Ministry audit sample in June was lethal and the LC50 was 44.6 % effluent.

Total Mill Outfall Stream

13900003 sampled: 01/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900006 sampled: 02/12/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900011 sampled: 03/13/90 LC50: 81.0 %
95% fid. limits: 67.0 - 115.0 % slope: 4.5
comments:

13900015 sampled: 04/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900018 sampled: 05/08/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 29

02900108 sampled: 06/12/90 LC50: 44.6 %
95% fid. limits: 40.5 - 49.1 %
comments: MISA Audit; Low D.O.

13900024 sampled: 06/12/90 LC50: 38.2 %
95% fid. limits: 20.8 - 63.2 % slope: 1.8
comments:

COMPANY: Domtar Inc., St. Catharines
(140509)
(now with Fine Paper Division)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for one test of rainbow trout acute lethality conducted on a sample of Clarifier Outlet effluent collected between January and June 1990 were provided by Domtar Inc., St. Catharines. The sample was nonlethal. A Ministry audit sample in June was nonlethal.

Clarifier Outlet

13900023 sampled: 06/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01900115 sampled: 06/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

Inatke Water

Emergency Overflow

COMPANY: Domtar Inc., St. Catharines
(140509)
(now with Fine Paper Division)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Clarifier Outlet effluent collected between January and June 1990 were provided by Domtar Inc., St. Catharines. Two samples were nonlethal and two samples were LC50 > 100 % effluent. Two samples were lethal to Daphnia and the LC50s were 97.0 and 53.4 % effluent. A Ministry audit sample in June was LC50 > 100 % effluent.

Clarifier Outlet

13900004 sampled: 01/10/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900008 sampled: 02/13/90 LC50: 97.0 %
95% fid. limits: 79.0 - 200.0 %
comments:

13900012 sampled: 03/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900016 sampled: 04/17/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

13900020 sampled: 05/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

13900023 sampled: 06/12/90 LC50: 53.4 %
95% fid. limits: 31.0 - 128.8 % slope: 1.6
comments:

02900115 sampled: 06/18/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

COMPANY: Domtar Inc., Trenton
(140608)
(now with Containerboard Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for one test of rainbow trout acute lethality conducted on a sample of Mill Combined Effluent collected between January and June 1990 were provided by Domtar Inc., Trenton. The sample was lethal, and the LC50 was 17.3 % effluent. A Ministry audit sample in June was lethal, and the LC50 was 50.1 % effluent.

Mill Combined Effluent

01900104 sampled: 06/04/90 LC50: 50.1 %
95% fid. limits: 40.0 - 65.0 %
comments: MISA Audit

13900021 sampled: 06/12/90 LC50: 17.3 %
95% fid. limits: 10.0 - 30.0 %
comments:

South Drainage Ditch STP1

Boat Ramp STC2

North Storm Pipe STP6

Rain Gauge

Intake Water

Emergency Overflow COS2

Emergency Overflow STP6

COMPANY: Domtar Inc., Trenton
(140608)
(now with Containerboard Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Mill Combined Effluent collected between January and June 1990 were provided by Domtar Inc., Trenton. Five samples were lethal to Daphnia and the LC50s ranged from 45.0 to 89.3 % effluent. One sample was LC50 > 100 % effluent. A Ministry audit sample in June was lethal, but an LC50 could not be calculated.

Mill Combined Effluent

13900001 sampled: 01/08/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 % slope: 0.3
comments:

13900005 sampled: 02/12/90 LC50: 63.0 %
95% fid. limits: 51.0 - 87.0 %
comments:

13900009 sampled: 03/13/90 LC50: 45.0 %
95% fid. limits: 40.0 - 50.0 %
comments:

13900013 sampled: 04/10/90 LC50: 65.0 %
95% fid. limits: 56.3 - 78.2 %
comments:

13900017 sampled: 05/08/90 LC50: 89.3 %
95% fid. limits: 77.4 - 120.1 %
comments:

13900104 sampled: 06/04/90 LC50: 0.0 - 0.0 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Bell shaped LC50 curve; Low D.O.

13900021 sampled: 06/12/90 LC50: 48.4 %
95% fid. limits: 44.5 - 64.6 %
comments:

COMPANY: E.B. Eddy Forest Products Ltd., Ottawa (980201)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Effluent Discharge collected between January and June 1990 were provided by E.B. Eddy Forest Products Ltd., Ottawa. Two samples were LC50 > 100 % effluent. Four samples were lethal to trout and the LC50s ranged from 43.5 to 80.6 % effluent. A Ministry audit sample in March was nonlethal.

Effluent Discharge

06900021 sampled: 01/09/90 LC50: 54.8 %
95% fid. limits: 51.0 - 59.0 %
comments: 100% MORTALITY IN 65% TEST CONCENTRATION

06900230 sampled: 02/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH EFFLUENT

06900347 sampled: 03/05/90 LC50: 43.5 %
95% fid. limits: 38.9 - 48.6 %
comments: 70% MORTALITY IN 50% TEST CONCENTRATION

01900051 sampled: 03/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

06900464 sampled: 04/02/90 LC50: 45.2 %
95% fid. limits: 40.1 - 50.9 %
comments: 60% MORTALITY IN 50% TEST CONCENTRATION

06900576 sampled: 05/08/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: 100% MORTALITY IN THE 100% CONCENTION

06900670 sampled: 06/05/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 40% MORTALITY IN THE 100% CONCENTRATION

COMPANY: E.B. Eddy Forest Products Ltd., Ottawa (980201)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Effluent Discharge collected between January and June 1990 were provided by E.B. Eddy Forest Products Ltd., Ottawa. All six samples were lethal to Daphnia and the LC50s ranged from 18.6 to 94.7 % effluent. Ministry audit samples in February and March were lethal and the LC50s were 15.0 to 30.0 and 44.9 % effluent.

Effluent Discharge

06900022 sampled: 01/09/90 LC50: 37.0 %
95% fid. limits: 33.9 - 40.4 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION

06900231 sampled: 02/05/90 LC50: 45.2 %
95% fid. limits: 40.1 - 50.9 %
comments: 60% MORTALITY IN 50% TEST CONCENTRATION

02900019 sampled: 02/20/90 LC50: 15.0 - 30.0 %
95% fid. limits: 15.0 - 30.0 %
comments: MISA Audit/high biological oxygen demand

06900348 sampled: 03/05/90 LC50: 18.6 %
95% fid. limits: 15.6 - 22.1 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

02900051 sampled: 03/27/90 LC50: 44.9 %
95% fid. limits: 35.8 - 55.2 % slope: 7.9
comments: MISA Audit; High B.O.D

06900465 sampled: 04/02/90 LC50: 34.7 %
95% fid. limits: 28.8 - 44.6 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION

06900577 sampled: 05/08/90 LC50: 20.0 - 100.0 %
95% fid. limits: 0.0 - 0.0 %
comments: FIBROUS STRUCTURE IMMOBILIZED DAPHNIDS

06900669 sampled: 06/05/90 LC50: 94.7 %
95% fid. limits: 0.0 - 0.0 %
comments: CONFIDENCE LIMITS CAN NOT BE CALCULATED.

COMPANY: E.B.Eddy Forest Products Ltd., Espanola (980003)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for five tests of rainbow trout acute lethality conducted on samples of Main Mill Sewer effluent collected between January and June 1990 were provided by E.B. Eddy Forest Products Ltd., Espanola. Three samples were nonlethal to trout and two samples were LC50 > 100 % effluent. A Ministry audit sample in April was nonlethal.

The data for three tests (one test was invalid) of rainbow trout acute lethality conducted on samples of Hot Water Tank effluent collected between January and June 1990 were provided by E.B. Eddy Forest Products Ltd., Espanola. All three samples were nonlethal to trout.

Main Mill Sewer

06900033 sampled: 01/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900271 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900392 sampled: 03/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN 65% TEST CONCENTRATION

06900480 sampled: 04/03/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH EFFLUENT

01000065 sampled: 04/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

06900560 sampled: 05/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Hot Water Tank

06900315 sampled: 02/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900423 sampled: 03/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900590 sampled: 05/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Power Canal

Woodroom

Filter Backwash

Rain Gauge

Intake Water

COMPANY: E.B.Eddy Forest Products Ltd., Espanola (980003)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Main Mill Sewer effluent collected between January and June 1990 were provided by E.B. Eddy Forest Products Ltd., Espanola. Five samples were nonlethal to Daphnia and one sample was LC50 > 100 % effluent. A Ministry audit sample in April was nonlethal.

The data for five tests (one test was not possible due to a shutdown of the mill) of Daphnia magna acute lethality conducted on samples of Hot Water Tank effluent collected between January and June 1990 were provided by E.B. Eddy Forest Products Ltd., Espanola. All five samples were nonlethal to Daphnia.

Main Mill Sewer

06900034 sampled: 01/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900272 sampled: 02/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OBSERVED IN 48 HOURS

06900393 sampled: 03/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900481 sampled: 04/03/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

02900065 sampled: 04/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: High Conductivity; MISA Audit

06900561 sampled: 05/07/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 30% MORTALITY IN FULL STRENGTH CONCENTRATION

06900664 sampled: 06/04/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED DURING TE

Hot Water Tank

06900215 sampled: 01/30/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48HRS

06900316 sampled: 02/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900424 sampled: 03/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900591 sampled: 05/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900828 sampled: 06/26/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED DURING TE

Power Canal

Woodroom

Filter Backwash

Rain Gauge

Intake Water

COMPANY: James River Marathon Ltd., Marathon (850008)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Final Effluent PE1 collected between January and June 1990 were provided by James River-Marathon Ltd., Marathon. All six samples were lethal to trout and the LC50s ranged from 13.6 to 32.6 % effluent. A Ministry audit sample in June was lethal and the LC50 was 34.6 % effluent.

The data for four tests of rainbow trout acute lethality conducted on samples of Evaps Cooling Water CW1 effluent collected between January and June 1990 were provided by James River-Marathon Ltd., Marathon. All four samples were nonlethal to trout. A Ministry audit sample in June was LC50 > 100 % effluent.

The data for four tests of rainbow trout acute lethality conducted on samples of Hypo Cooling Water CW1 effluent collected between January and June 1990 were provided by James River-Marathon Ltd., Marathon. All four samples were nonlethal to trout. A Ministry audit sample in June was nonlethal.

Final Effluent PE1

04900069 sampled: 01/08/90 LC50: 14.1 %
95% fid. limits: 0.0 - 0.0 %
comments:

04900291 sampled: 02/12/90 LC50: 14.1 %
95% fid. limits: 0.0 - 0.0 %
comments:

04900517 sampled: 03/05/90 LC50: 14.1 %
95% fid. limits: 0.0 - 0.0 %
comments:

04900775 sampled: 04/02/90 LC50: 13.6 %
95% fid. limits: 0.0 - 0.0 %
comments:

04901013 sampled: 05/01/90 LC50: 32.6 %
95% fid. limits: 28.1 - 37.6 %
comments:

04901379 sampled: 06/04/90 LC50: 29.1 %
95% fid. limits: 26.1 - 32.5 %
comments:

01900120 sampled: 06/21/90 LC50: 34.6 %
95% fid. limits: 30.0 - 40.0 %
comments: MISA Audit

Evaps Cooling Water CW1

04900011 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04900289 sampled: 02/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04900584 sampled: 03/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04901533 sampled: 06/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01900121 sampled: 06/20/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

Hypo Cooling Water CW1

04900091 sampled: 01/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04900290 sampled: 02/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04900583 sampled: 03/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04901532 sampled: 06/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

01900122 sampled: 06/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

COMPANY: James River Marathon Ltd., Marathon (850008)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Final Effluent PE1 collected between January and June 1990 were provided by James River-Marathon Ltd., Marathon. All six samples were lethal to Daphnia and the LC50s ranged from 13.2 to 80.6 % effluent. A Ministry audit sample in June was lethal and the LC50 was 15.0 to 30.0 % effluent.

The data for six tests of Daphnia magna acute lethality conducted on samples of Evaps Cooling Water CW1 effluent collected between January and June 1990 were provided by James River-Marathon Ltd., Marathon. Two samples were LC50 > 100 % effluent and four samples were nonlethal. A Ministry audit sample in June was LC50 > 100 % effluent.

The data for six tests of Daphnia magna acute lethality conducted on samples of Hypo Cooling Water CW1 effluent collected between January and June 1990 were provided by James River-Marathon Ltd., Marathon. Three samples were nonlethal and three samples were LC50 > 100 % effluent. A Ministry audit sample in June was LC50 > 100 % effluent.

Final Effluent PE1

04900069 sampled: 01/08/90 LC50: 13.2 %
95% fid. limits: 0.0 - 0.0 %
comments:

04900291 sampled: 02/12/90 LC50: 19.5 %
95% fid. limits: 16.6 - 22.7 %
comments:

04900517 sampled: 03/05/90 LC50: 14.8 %
95% fid. limits: 13.5 - 16.1 %
comments:

04900775 sampled: 04/02/90 LC50: 14.1 %
95% fid. limits: 0.0 - 0.0 %
comments:

04901013 sampled: 05/01/90 LC50: 80.6 %
95% fid. limits: 69.2 - 93.8 %
comments:

04901379 sampled: 06/04/90 LC50: 16.6 %
95% fid. limits: 11.7 - 23.5 %
comments:

02900120 sampled: 06/21/90 LC50: 15.0 - 30.0 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; High Conductivity

Evaps Cooling Water CW1

04900011 sampled: 01/02/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04900289 sampled: 02/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04900584 sampled: 03/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

04900963 sampled: 04/23/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 48 Hour LC50 > 100%

04901173 sampled: 05/21/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 48 hour LC50 > 100%

04901533 sampled: 06/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02900121 sampled: 06/20/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

Hypo Cooling Water CW1

04900091 sampled: 01/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04900290 sampled: 02/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: non-lethal

04900583 sampled: 03/12/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 48 hr LC50 > 100%

04900962 sampled: 04/23/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 48 Hour LC50 > 100%

04901172 sampled: 05/21/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 48 hour LC50 > 100%

04901532 sampled: 06/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

02900122 sampled: 06/20/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit

Storm Water # 1

Storm Water # 2

Storm Water # 3

Storm Water # 4

Storm Water # 5

Rain Gauge

Intake Water

Main Mill Portion

Acid Effluent Portion

COMPANY: Kimberly-Clark of Canada Limited, Huntsville (830109)
SECTOR: pulp and paper
REGION: Central

SUMMARY
The data for three tests of rainbow trout acute lethality conducted on samples of Effluent Discharge collected between January and June 1990 were provided by Kimberly-Clark Canada Ltd., Huntsville. All three samples were nonlethal to trout.

Effluent Discharge

03900010 sampled: 01/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900105 sampled: 02/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900191 sampled: 03/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

Storm Water Drainage

Rain Gauge

Intake Water

COMPANY: Kimberly-Clark of Canada Limited, Huntsville (830109)
SECTOR: pulp and paper
REGION: Central

SUMMARY
The data for four tests of Daphnia magna acute lethality conducted on samples of Effluent Discharge collected between January and June 1990 were provided by Kimberly-Clark Canada Ltd., Huntsville. All four samples were nonlethal to Daphnia.

Effluent Discharge

03900010 sampled: 01/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900105 sampled: 02/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900191 sampled: 03/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900285 sampled: 04/09/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

Storm Water Drainage

Rain Gauge

Intake Water

COMPANY: Kimberly-Clark of Canada Limited, St. Catharines (830208)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Final Effluent collected between January and June 1990 were provided by Kimberly-Clark Canada Ltd., St. Catharines. Two samples were nonlethal and four samples were LC50 > 100 % effluent.

Final Effluent

03900052 sampled: 01/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900140 sampled: 02/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900237 sampled: 03/22/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

03900319 sampled: 04/19/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: Single concentration test

03900412 sampled: 05/17/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 5% mortality @ 100% eff.;single conc. test

03900514 sampled: 06/21/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

Intake Water

Emergency Overflow

COMPANY: Kimberly-Clark of Canada Limited, St. Catharines (830208)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Final Effluent collected between January and June 1990 were provided by Kimberly-Clark Canada Ltd., St. Catharines. Four samples were nonlethal to Daphnia and two samples were LC50 > 100 % effluent.

Final Effluent

03900052 sampled: 01/18/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100%

03900140 sampled: 02/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900237 sampled: 03/22/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non-lethal

03900319 sampled: 04/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900412 sampled: 05/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: Non lethal

03900514 sampled: 06/21/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: LC50 >100

Intake Water

Emergency Overflow

COMPANY: Kimberly-Clark of Canada Ltd., Terrace Bay (830000)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Combined Effluent KCS1 collected between January and June 1990 were provided by Kimberly-Clark Canada Ltd., Terrace Bay. All six samples were nonlethal to trout.

The data for six tests of rainbow trout acute lethality conducted on samples of Cooling Water effluent collected between January and June 1990 were provided by Kimberly-Clark Canada Ltd., Terrace Bay. All six samples were nonlethal to trout.

Combined Effluent KCS1

10900013 sampled: 01/07/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900081 sampled: 02/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900139 sampled: 03/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900197 sampled: 04/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900245 sampled: 05/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900284 sampled: 06/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Storm Sewer-Bark PileKCP3

Storm Sewer-Bulk KCP4

Storm Sewer Chip PileKCC1

Rain Gauge

Intake Water

Emergency Overflow KCS3

cooling water

10900038 sampled: 01/21/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: RESIDUAL CL2 = 0.14 MG/L

10900097 sampled: 02/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: RESIDUAL CL2 = 0.10 mg/l

10900152 sampled: 03/18/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900213 sampled: 04/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900251 sampled: 05/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900296 sampled: 06/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

COMPANY: Kimberly-Clark of Canada Ltd., Terrace Bay (830000)
SECTOR: pulp and paper
REGION: Northwest

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Combined Effluent KCS1 collected between January and June 1990 were provided by Kimberly-Clark Canada Ltd., Terrace Bay. Five samples were nonlethal to Daphnia and one sample was LC50 > 100 % effluent.

The data for six tests of Daphnia magna acute lethality conducted on samples of Cooling Water effluent collected between January and June 1990 were provided by Kimberly-Clark Canada Ltd., Terrace Bay. Five samples were lethal to Daphnia and the LC50s were 63.1 to 89.0 % effluent. One sample was LC50 > 100 % effluent.

Combined Effluent KCS1

10900013 sampled: 01/07/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

10900081 sampled: 02/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900139 sampled: 03/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900197 sampled: 04/08/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900245 sampled: 05/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

10900284 sampled: 06/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

Kimberly-Clark of Canada Ltd. (continued)

Storm Sewer-Bark PileKCP3

Storm Sewer-Bulk KCP4

Storm Sewer Chip PileKCC1

Rain Gauge

Intake Water

Emergency Overflow KCS3

cooling water

10900038 sampled: 01/21/90 LC50: 66.1 %
95% fid. limits: 56.6 - 77.2 %
comments: RESIDUAL CL2 = 0.14 MG/L

10900097 sampled: 02/18/90 LC50: 63.1 %
95% fid. limits: 53.5 - 74.2 %
comments:

10900152 sampled: 03/18/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

10900213 sampled: 04/15/90 LC50: 79.5 %
95% fid. limits: 67.5 - 94.7 %
comments:

10900251 sampled: 05/20/90 LC50: 89.0 %
95% fid. limits: 72.7 - 135.4 % slope: 5.7
comments:

10900296 sampled: 06/17/90 LC50: 79.4 %
95% fid. limits: 68.9 - 91.4 %
comments:

COMPANY: Macmillan-Bloedel Limited, Sturgeon Falls (1530005)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
A Ministry audit sample of Clean Sewer Effluent P-1 in March was lethal, and the LC50 was 7.1 % effluent. An audit of Treated Effluent P-2 in March was lethal and the LC50 was 10.7 % effluent.

Clean Sewer Effluent P-1

01900042 sampled: 03/19/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: MISA Audit

Treated Effluent P-2

01900041 sampled: 03/19/90 LC50: 10.7 %
95% fid. limits: 8.7 - 13.3 %
comments: MISA Audit

Intake Water

COMPANY: Macmillan-Bloedel Limited, Sturgeon Falls (1530005)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
A Ministry audit sample of Clean Sewer Effluent P-1 in March was lethal, and the LC50 was 5.0 to 15.0 % effluent. An audit of Treated Effluent P-2 in March was lethal and the LC50 was 42.3 % effluent.

Clean Sewer Effluent P-1

02900042 sampled: 03/19/90 LC50: 5.0 - 15.0 %
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit/low pH, high B.O.D. & conductivity

Treated Effluent P-2

02900041 sampled: 03/19/90 LC50: 42.3 %
95% fid. limits: 34.7 - 51.4 %
comments: MISA Audit/low pH, low dissolved oxygen

Intake Water

COMPANY: Malette Inc., Smooth Rock Falls (860502)
(now with Pulp and Power Division)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Final Effluent collected between January and June 1990 were provided by Malette Inc., Smooth Rock Falls. All six samples were lethal to trout and the LC50s ranged from 18.6 to 52.6 % effluent.

Cooling water

Final Effluent

06900089 sampled: 01/15/90 LC50: 52.6 %
95% fid. limits: 40.7 - 64.4 %
comments: 100% MORTALITY IN FULL STRENGTH EFFLUENT

06900273 sampled: 02/12/90 LC50: 18.6 %
95% fid. limits: 15.6 - 22.1 %
comments: 50% MORTALITY IN 20% TEST CONCENTRATION

06900394 sampled: 03/12/90 LC50: 29.9 %
95% fid. limits: 24.4 - 38.5 %
comments: 10% MORTALITY IN 20% TEST CONCENTRATION

06900519 sampled: 04/09/90 LC50: 30.1 %
95% fid. limits: 25.0 - 37.2 %
comments: 40% MORTALITY IN 30% TEST CONCENTRATION

06900613 sampled: 05/14/90 LC50: 32.2 %
95% fid. limits: 28.0 - 37.2 %
comments: 40% MORTALITY IN 30% TEST CONCENTRATION

06900732 sampled: 06/11/90 LC50: 24.5 %
95% fid. limits: 20.0 - 30.0 %
comments:

COMPANY: Malette Inc., Smooth Rock Falls (860502)
(now with Pulp and Power Division)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Final Effluent collected between January and June 1990 were provided by Malette Inc., Smooth Rock Falls. All six samples were lethal to Daphnia and the LC50s ranged from 14.9 to 77.0 % effluent.

Cooling water

Final Effluent

06900090 sampled: 01/15/90 LC50: 77.0 %
95% fid. limits: 63.6 - 105.0 %
comments: 80% MORTALITY IN FULL STRENGTH EFFLUENT

06900274 sampled: 02/12/90 LC50: 14.9 %
95% fid. limits: 13.5 - 16.6 %
comments: 90% MORTALITY IN 20% CONCENTRATION

06900395 sampled: 03/12/90 LC50: 26.2 %
95% fid. limits: 21.0 - 33.0 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900520 sampled: 04/09/90 LC50: 24.2 %
95% fid. limits: 23.4 - 24.9 %
comments: 100% MORTALITY IN 30% TEST CONCENTRATION

06900614 sampled: 05/14/90 LC50: 28.1 %
95% fid. limits: 24.6 - 32.1 %
comments: 70% MORTALITY IN THE 30% CONCENTRATION

06900733 sampled: 06/11/90 LC50: 23.2 %
95% fid. limits: 20.8 - 25.7 %
comments: 10% MORTALITY IN THE 20% CONCENTRATION

COMPANY: Noranda Forest Inc., Thorold (940007)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Circular Clarifier effluent collected between January and June 1990 were provided by Noranda Forest Inc., Thorold. All six samples were lethal to trout and the LC50s ranged from 4.1 to 80.6 % effluent. A Ministry audit sample collected by the Aquatic Toxicity Unit in April was lethal and the LC50 was 34.6 % effluent.

Circular Clarifier

06900070 sampled: 01/17/90 LC50: 29.4 %
95% fid. limits: 25.5 - 33.9 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION

06900293 sampled: 02/15/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: COMPLETE MORTALITY IN FULL STRENGTH EFFLUENT

06900358 sampled: 03/06/90 LC50: 17.6 %
95% fid. limits: 14.9 - 20.9 %
comments: 60% MORTALITY IN 20% TEST CONCENTRATION

01900062 sampled: 04/04/90 LC50: 34.6 %
95% fid. limits: 30.0 - 40.0 %
comments: MISA Audit

06900467 sampled: 04/04/90 LC50: 4.1 %
95% fid. limits: 3.2 - 5.4 %
comments: 70% MORTALITY IN 5% TEST CONCENTRATION

06900596 sampled: 05/15/90 LC50: 6.3 %
95% fid. limits: 5.4 - 7.3 %
comments: 100% MORTALITY IN 10% TEST CONCENTRATION

06900662 sampled: 06/05/90 LC50: 10.9 %
95% fid. limits: 8.8 - 13.4 %
comments: 30% MORTALITY IN THE10% CONCENTRATION

COMPANY: Noranda Forest Inc., Thorold (940007)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Circular Clarifier effluent collected between January and June 1990 were provided by Noranda Forest Inc., Thorold. Five samples were lethal to Daphnia and the LC50s ranged from 1.7 to 57.0 % effluent. One sample was LC50 > 100 % effluent.

Circular Clarifier

06900073 sampled: 01/17/90 LC50: 57.0 %
95% fid. limits: 50.0 - 65.0 %
comments: 100% MORTALITY IN 65% TEST CONCENTRATION

06900294 sampled: 02/15/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH EFFLUENT

06900359 sampled: 03/06/90 LC50: 21.9 %
95% fid. limits: 19.1 - 25.2 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900468 sampled: 04/04/90 LC50: 7.1 %
95% fid. limits: 5.0 - 10.0 %
comments: 100% MORTALITY IN 10% TEST CONCENTRATION

06900597 sampled: 05/15/90 LC50: 1.7 %
95% fid. limits: 1.0 - 3.0 %
comments: 100% MORTALITY IN THE 3% CONCENTRATION

06900663 sampled: 06/05/90 LC50: 16.7 %
95% fid. limits: 14.2 - 19.5 %
comments: 70% MORTALITY IN THE 20% CONCENTRATION

Intake Water

Main Sewer Emergency Ovfl

Clarifier Emergency Ovflw

COMPANY: Quebec and Ontario Paper Co. Ltd., Thorold (930008)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for four tests of rainbow trout acute lethality conducted on samples of Final Mill Effluent collected between January and June 1990 were provided by Quebec and Ontario Paper Co. Ltd., Thorold. Two samples were nonlethal to trout and two samples were LC50 > 100 % effluent.

Final Mill effluent

06900107 sampled: 01/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900275 sampled: 02/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH EFFLUENT

06900402 sampled: 03/14/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN 20% & 30% TEST CONCENTRATION

06900752 sampled: 06/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Intake Water

COMPANY: Quebec and Ontario Paper Co. Ltd., Thorold (930008)
SECTOR: pulp and paper
REGION: West Central

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Final Mill Effluent collected between January and June 1990 were provided by Quebec and Ontario Paper Co. Ltd., Thorold. All six samples were nonlethal to Daphnia.

Final Mill effluent

06900108 sampled: 01/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900276 sampled: 02/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900403 sampled: 03/14/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900518 sampled: 04/11/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HOU

06900607 sampled: 05/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900753 sampled: 06/13/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Intake Water

COMPANY: Roman Corporation Limited, Strathcona (1740000)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Lagoon #7 To River effluent collected between January and June 1990 were provided by Roman Corp. Ltd., Strathcona. Two samples were nonlethal to trout and one sample was LC50 > 100 % effluent. Three sample were lethal and the LC50s ranged from 39.0 to 80.6 % effluent. A Ministry audit sample in April was lethal and the LC50 was 24.5 % effluent.

The data for four tests of rainbow trout acute lethality conducted on samples of Raw Water Drain effluent collected between January and June 1990 were provided by Roman Corp. Ltd., Strathcona. All four samples were nonlethal to trout. A Ministry audit sample in April was nonlethal.

The data for four tests of rainbow trout acute lethality conducted on samples of Boiler Water Drain effluent collected between January and June 1990 were provided by Roman Corp. Ltd., Strathcona. Two samples were nonlethal and one sample was LC50 > 100 % effluent. One sample was lethal and the LC50 was 81.5 % effluent. A Ministry audit sample in April was lethal and the LC50 was 51.0 % effluent.

Lagoon #7 to River

06900076 sampled: 01/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900269 sampled: 02/13/90 LC50: 39.0 %
95% fid. limits: 30.0 - 50.0 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION

06900386 sampled: 03/13/90 LC50: 50.4 %
95% fid. limits: 38.2 - 57.2 %
comments: 50% MORTALITY IN 50% TEST CONCENTRATION

01900066 sampled: 04/09/90 LC50: 24.5 %
95% fid. limits: 20.0 - 30.0 %
comments: MISA Audit

06900511 sampled: 04/10/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: 100% MORTALITY IN FULL STRENGTH EFFLUENT

06900594 sampled: 05/15/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments:

06900742 sampled: 06/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Raw Water Drain

06900201 sampled: 01/29/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900305 sampled: 02/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900421 sampled: 03/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900068 sampled: 04/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit; Non-lethal

06900779 sampled: 06/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

Boiler Water Drain

06900108 sampled: 01/30/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900329 sampled: 02/26/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN FULL STRENGTH SAMPLE.

06900444 sampled: 03/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900067 sampled: 04/09/90 LC50: 51.0 %
95% fid. limits: 40.0 - 65.0 %
comments: MISA Audit

06900819 sampled: 06/26/90 LC50: 81.5 %
95% fid. limits: 70.0 - 99.4 % slope: 10.0
comments: 20% MORTALITY IN THE 65% CONCENTRATION

COMPANY: Roman Corporation Limited, Strathcona (1740000)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY

The data for six tests of Daphnia magna acute lethality conducted on samples of Lagoon #7 To River effluent collected between January and June 1990 were provided by Roman Corp. Ltd., Strathcona. Three samples were nonlethal and one sample was LC50 > 100 % effluent. Two samples were lethal and the LC50s were 63.3 and 87.3 % effluent. A Ministry audit sample in April was lethal and the LC50 was 70.0 % effluent.

The data for six tests of Daphnia magna acute lethality conducted on samples of Raw Water Drain effluent collected between January and June 1990 were provided by Roman Corp. Ltd., Strathcona. All six samples were nonlethal to Daphnia. A Ministry audit sample in April was nonlethal.

The data for six tests of Daphnia magna acute lethality conducted on samples of Boiler Water Drain effluent collected between January and June 1990 were provided by Roman Corp. Ltd., Strathcona. One sample was lethal to Daphnia and the LC50 was 77.0 % effluent. Four samples were nonlethal and one sample was LC50 > 100 % effluent. A Ministry audit sample in April was lethal and the LC50 was 51.8 % effluent.

Lagoon #7 to River

06900079 sampled: 01/16/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900270 sampled: 02/13/90 LC50: 63.3 %
95% fid. limits: 57.2 - 69.9 %
comments: 70% MORTALITY IN 65% TEST CONCENTRATION

06900387 sampled: 03/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

02900066 sampled: 04/09/90 LC50: 70.0 %
95% fid. limits: 61.5 - 79.8 %
comments: MISA Audit; Low D.O.

06900512 sampled: 04/10/90 LC50: 87.3 %
95% fid. limits: 0.0 - 0.0 %
comments: 80% MORTALITY IN FULL STRENGTH EFFLUENT

06900595 sampled: 05/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900743 sampled: 06/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Raw Water Drain

06900202 sampled: 01/29/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HR

06900306 sampled: 02/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900422 sampled: 03/20/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

02900068 sampled: 04/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: MISA Audit sample

06900531 sampled: 04/17/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900638 sampled: 05/28/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments:

06900780 sampled: 06/19/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

Boiler Water Drain

06900204 sampled: 01/30/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OBSERVED IN 48 HRS

06900330 sampled: 02/26/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900445 sampled: 03/27/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

02900067 sampled: 04/09/90 LC50: 51.8 %
95% fid. limits: 44.0 - 61.0 %
comments: MISA Audit; Many floaters

06900548 sampled: 04/24/90 LC50: 77.0 %
95% fid. limits: 0.0 - 0.0 %
comments: 90% MORTALITY IN FULL STRENGTH EFFLUENT

06900637 sampled: 05/29/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OBSERVED DURING TEST PERIOD

06900820 sampled: 06/26/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 10% MORTALITY IN 100% TEST CONCENTRATION

Intake Water

COMPANY: Spruce Falls Power and Paper Co.Ltd, Kapuskasing (1340009)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Mill Main Sewer effluent collected between January and June 1990 were provided by Spruce Falls Power and Paper Co. Ltd., Kapuskasing. All six samples were lethal to trout and the LC50s ranged from 5.3 to 28.3 % effluent. A Ministry audit sample in June was lethal and the LC50 was 43.7 % effluent.

Mill Main Sewer

10900019 sampled: 01/07/90 LC50: 5.3 %
95% fid. limits: 4.6 - 6.0 %
comments:

10900088 sampled: 02/11/90 LC50: 6.9 %
95% fid. limits: 5.1 - 9.2 % slope: 6.0
comments:

10900143 sampled: 03/11/90 LC50: 11.3 %
95% fid. limits: 0.0 - 0.0 %
comments: CONFIDENCE LIMITS UNRELIABLE

10900204 sampled: 04/08/90 LC50: 12.1 %
95% fid. limits: 10.6 - 13.8 %
comments:

03900363 sampled: 05/06/90 LC50: 28.3 %
95% fid. limits: 20.0 - 40.0 %
comments:

01900103 sampled: 06/05/90 LC50: 43.7 %
95% fid. limits: 38.7 - 49.2 %
comments: MISA Audit

03900463 sampled: 06/11/90 LC50: 28.3 %
95% fid. limits: 20.0 - 40.0 %
comments:

Storm Water SW1

COMPANY: Spruce Falls Power and Paper Co.Ltd, Kapuskasing (1340009)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Mill Main Sewer effluent collected between January and June 1990 were provided by Spruce Falls Power and Paper Co. Ltd., Kapuskasing. All six samples were lethal to Daphnia and the LC50s ranged from 20.2 to 63.7 % effluent. A Ministry audit sample in June was lethal and the LC50 was 54.3 % effluent.

Mill Main Sewer

10900019 sampled: 01/07/90 LC50: 20.2 %
95% fid. limits: 17.3 - 23.4 %
comments:

10900088 sampled: 02/11/90 LC50: 22.7 %
95% fid. limits: 17.7 - 29.4 % slope: 6.5
comments:

10900143 sampled: 03/11/90 LC50: 52.4 %
95% fid. limits: 45.2 - 60.6 %
comments:

10900204 sampled: 04/08/90 LC50: 24.1 %
95% fid. limits: 18.6 - 33.0 % slope: 5.7
comments:

03900363 sampled: 05/06/90 LC50: 63.7 %
95% fid. limits: 48.5 - 83.4 % slope: 5.8
comments:

02900103 sampled: 06/05/90 LC50: 54.3 %
95% fid. limits: 42.3 - 67.4 % slope: 6.4
comments: MISA Audit; Low D.O.

03900463 sampled: 06/11/90 LC50: 61.4 %
95% fid. limits: 48.0 - 78.5 % slope: 5.8
comments:

Storm Water SW1

COMPANY: St. Marys Paper Inc., Sault Ste. Marie (860304)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Clear To River effluent collected between January and June 1990 were provided by St. Mary's Paper Inc., Sault Ste. Marie. All six samples were lethal to trout and the LC50s ranged from 16.7 to 77.9 % effluent.

Clear to River

06900149 sampled: 01/24/90 LC50: 38.7 %
95% fid. limits: 30.0 - 50.0 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION

06900283 sampled: 02/14/90 LC50: 33.8 %
95% fid. limits: 29.5 - 38.5 %
comments: 30% MORTALITY IN 30% TEST CONCENTRATION

06900406 sampled: 03/14/90 LC50: 39.0 %
95% fid. limits: 30.0 - 50.0 %
comments: 100% MORTALITY IN 50% TEST CONCENTRATION

06900532 sampled: 04/18/90 LC50: 16.7 %
95% fid. limits: 14.2 - 19.5 %
comments: 70% MORTALITY IN 20% TEST CONCENTRATION

06900608 sampled: 05/16/90 LC50: 32.2 %
95% fid. limits: 28.0 - 37.2 %
comments: 40% MORTALITY IN 30% TEST CONCENTRATION

06900748 sampled: 06/13/90 LC50: 77.9 %
95% fid. limits: 72.9 - 83.1 %
comments: 10% MORTALITY IN THE 65% CONCENTRATION

Emergency Overflow

Intake Water

COMPANY: St. Marys Paper Inc., Sault Ste. Marie (860304)
SECTOR: pulp and paper
REGION: Northeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Clear To River effluent collected between January and June 1990 were provided by St. Mary's Paper Inc., Sault Ste. Marie. All six samples were lethal to Daphnia and the LC50s ranged from 19.7 to 64.6 % effluent.

Clear to River

06900150 sampled: 01/24/90 LC50: 19.7 %
95% fid. limits: 16.6 - 23.3 %
comments: 100% MORTALITY IN 30% TEST CONCENTRATION

06900284 sampled: 02/14/90 LC50: 40.1 %
95% fid. limits: 31.7 - 52.3 %
comments: 50% MORTALITY IN 30% TEST CONCENTRATION

06900407 sampled: 03/14/90 LC50: 53.5 %
95% fid. limits: 43.0 - 61.8 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900533 sampled: 04/18/90 LC50: 26.2 %
95% fid. limits: 21.1 - 33.0 %
comments: 60% MORTALITY IN 30% TEST CONCENTRATION

06900609 sampled: 05/16/90 LC50: 64.6 %
95% fid. limits: 55.2 - 78.3 %
comments: 40% MORTALITY IN 65% TEST CONCENTRATION

06900749 sampled: 06/13/90 LC50: 57.0 %
95% fid. limits: 50.0 - 65.0 %
comments: 100% MORTALITY IN 65% TEST CONCENTRATION

Emergency Overflow

Intake Water

COMPANY: Trent Valley, Trenton
(1750009)
(now with Paperboard Mills Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of rainbow trout acute lethality conducted on samples of Process Effluent collected between January and June 1990 were provided by Trent Valley, Trenton. Two samples were nonlethal to trout and one sample was LC50 > 100 % effluent. Three samples were lethal and the LC50s ranged from 42.4 to 100 % effluent. A Ministry audit sample in June was lethal and the LC50 was 80.6 % effluent.

Process Effluent

06900095 sampled: 01/16/90 LC50: 90.0 %
95% fid. limits: 84.1 - 95.7 %
comments: 80% MORTALITY IN FULL STRENGTH EFFLUENT

06900267 sampled: 02/13/90 LC50: 42.4 %
95% fid. limits: 35.8 - 52.0 %
comments: 70% MORTALITY IN 50% TEST CONCENTRATION

06900390 sampled: 03/13/90 LC50: 100.0 %
95% fid. limits: 0.0 - 0.0 %
comments: 40% MORTALITY IN 100% TEST CONCENTRATION

06900509 sampled: 04/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

06900592 sampled: 05/15/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 50% MORTALITY IN 100% TEST CONCENTRATION

06900746 sampled: 06/12/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR SUBLETHAL IMPAIRMENT OBSERVED

01900129 sampled: 06/26/90 LC50: 80.6 %
95% fid. limits: 65.0 - 100.0 %
comments: MISA Audit

COMPANY: Trent Valley, Trenton
(1750009)
(now with Paperboard Mills Division)
SECTOR: pulp and paper
REGION: Southeast

SUMMARY
The data for six tests of Daphnia magna acute lethality conducted on samples of Process Effluent collected between January and June 1990 were provided by Trent Valley, Trenton. Two samples were nonlethal and one sample was LC50 > 100 % effluent. Three samples were lethal to Daphnia and the LC50s ranged from 52.3 to 77.9 % effluent. A Ministry audit sample in June was lethal and the LC50 was 70.0 % effluent

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Process Effluent

06900096 sampled: 01/16/90 LC50: 65.5 %
95% fid. limits: 58.8 - 72.9 %
comments: 100% MORTALITY IN FULL STRENGTH EFFLUENT

06900268 sampled: 02/13/90 LC50: >100 %
95% fid. limits: 0.0 - 0.0 %
comments: 20% MORTALITY IN FULL STRENGTH EFFLUENT

06900391 sampled: 03/13/90 LC50: 77.9 %
95% fid. limits: 72.9 - 83.1 %
comments: UNSEASONABLE WARM TEMP RESULTED IN ELEVATION

06900510 sampled: 04/10/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HOU

06900593 sampled: 05/15/90 non-lethal
95% fid. limits: 0.0 - 0.0 %
comments: NO MORTALITY OR IMMOBILITY OBSERVED IN 48 HRS

06900747 sampled: 06/12/90 LC50: 52.3 %
95% fid. limits: 39.9 - 59.0 % slope: 13.7
comments: 40% MORTALITY IN 50% TEST CONCENTRATION.

02900129 sampled: 06/26/90 LC50: 70.0 %
95% fid. limits: 61.5 - 79.8 %
comments: MISA Audit; Very lo D.O.